

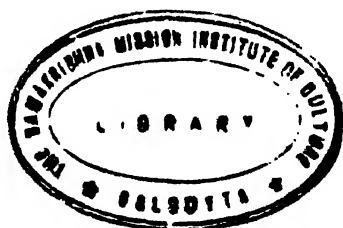
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# PHILOSOPHY AND METAPHYSICS.

THE PAPER AND SYMPOSIA FOR DISCUSSION AT THE  
JOINT SESSION OF THE ARISTOTELIAN SOCIETY,  
THE MIND ASSOCIATION AND THE OXFORD  
PHILOSOPHICAL SOCIETY, AT BALLIOL COLLEGE,  
OXFORD, JULY 24TH—27TH, 1925.



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## I.

FIRST SESSION: *July 24th, 1925, at 8.30 p.m.*

*Chairman*: PROFESSOR A. D. LINDSAY.

### SYMPOSIUM: THE NATURE OF INTELLIGENCE.

*By* H. WILDON CARR, A. WOLF AND C. SPEARMAN.

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#### I.—*By* H. WILDON CARR.

INTELLIGENCE is a mode of conscious activity. We are immediately acquainted with it in our living experience and are able to conceive it as a possibility wherever and in whatever form we recognize mind. Its characteristic is the bringing into play of reflective thought in the carrying out of actions. Reflective thought implies knowledge. Intelligence is not the possession of knowledge but the using of knowledge. Intelligence is distinguished from instinct and from reflex action by the reasoning process which it interposes between the reception of a stimulus and the responsive action.

The nature of intelligence is primarily a problem of evolution. *Homo sapiens* is the outcome of a specific evolution and it is the development in this species of intelligence as the mode of its activity which has enabled it to establish itself on the earth, for it is not distinguished by animal strength or by instinctive resourcefulness. Were man to be deprived of intelligence neither instincts nor adaptations would save the species from rapid extinction. What then is this specific character? Is it an advantage which at a certain stage of organic evolution

presented itself as a possibility, was accepted, and proved a success? Is it simply enlightenment? In its origin was it like the opening of Balaam's eyes when his ass spoke and he saw Jehovah's angel with the drawn sword? Did intelligence await organic evolution, or is it itself the outcome of a mental evolution progressing *pari passu* with the bodily evolution?

It is clear that the answer to these questions, and the solution of the evolutionary problem generally, must depend on and be bound up with our conception of the nature of knowledge on the possession of which intelligence itself depends. Is knowledge the apprehension of independent reality or is it the organization of experience? Intelligence differs in degree between races of mankind and also it varies in amount between individuals. Before we can treat it as in any manner scientifically measurable we must have a clear concept of the nature of knowledge.

There are two antithetical concepts of the nature of knowledge and the easiest way to make them clear is to go to their origin in the seventeenth century. The metaphysical theories of Descartes and of Leibniz respectively are of course both pre-evolutionary, but each has exercised a directing influence alike in science and in philosophy.

Descartes's "I think therefore I am" is not a syllogism. In so far as it is a starting point in reflective activity it is an immediate self-apprehension serving as a first definition of existence or reality. Descartes did, however, proceed to construct a logical edifice upon it. I think—what thinks is—therefore I am a thinking substance. I am individual—whatever is extended is divisible to infinity—therefore I am not an extension. The result was a fundamental dualism of thought and extension, mind being thinking substance, body being extended substance. Mind exists only in man and constitutes his rationality. It exercises a guiding or directing influence over his mechanically contrived actions. The brute beasts are pure machines. Knowledge

consists in ideas, some of which are innate and self-evident, some are adventitious and useful but not necessarily true. Sense and imagination are positively deceptive, designed only to protect the body, but reason is apprehension of reality guaranteed by the veracity of God. No sharper distinction has ever been made between thought and things. Mind possesses in its ideas knowledge of an independently existing world, separated from it absolutely by the exclusiveness of its essential attribute, extension...

Leibniz also distinguished between mind and body but on a different principle. The mind is essentially simple. It is individual and therefore has no parts. The body and the world of which it forms part are not simple but composite and divisible to infinity. If there are compounds, Leibniz argued, there must be real units composing them. These components cannot be the atoms of the old philosophy for they are extended. The real units are monads, simple and individual, qualitatively different from one another. Each monad is a centre of perceptive activity and monads rank in dignity according to the degree of clearness in their perceptions. The human mind is a rational monad. The world we perceive, our body and the other objects which it contains are compounds of active monads. The unity of the world consists in the harmony of its component activities. The world is neither spatially nor temporally conditioned. Space and time are for each monad the order of co-existences and successions in its perceptions. For Leibniz therefore, as for Descartes, there is a real world ideally apprehended by us and independent of us. Leibniz, however, conceived the nature of this real world in a diametrically opposite way to that of Descartes. For him there is no dead extension, there are no things, there are only minds.

Both these theories call for new interpretation in the light of present knowledge, particularly in regard to the new concept of biological evolution. Each principle has its exponents among leaders of scientific research but the nature of intelligence assumes

an entirely different aspect according to which of the two we accept and follow.

I myself follow the Leibnizian principle and I will first give my reasons for adopting it and then attempt to apply it to our present problem.

My first reason is that it appears to me impossible to offer a scientific explanation of knowledge and intelligence if we begin by conceiving mind and body to be substantially separate and existentially independent. Modern realism slurs over the mind-body relation and postulates the independent existence of the object of knowledge as a working hypothesis. But the body is an object of knowledge to the mind. The hypothesis does not work and the whole superstructure is fantastic. If mind and body are substantially distinct then knowledge is a miracle, as Descartes discovered when he based our knowledge of the external world on the veracity of God.

My second reason is that if the essential attribute of mind is activity and the essential attribute of matter inertia, it appears to me impossible to derive mind from matter. I do not mean merely that it is highly improbable, I mean that it is inconceivable, an obvious self-contradiction. If mind and body are one thing the interpretative principle of their appearances can only lie in mind. Descartes came up against this difficulty. To account for the imparting of movement to extension he introduced what Pascal satirically described as *une chiquenaude de Dieu*.

My third and most important reason is that the fundamental problem alike in science and in philosophy is the problem of the one and the many. How is real unity consistent with real plurality? On Descartes's principle the solution of the problem is impossible, as Spinoza clearly showed. Neither in science nor in philosophy can extension (space-time) provide an absolute. Yet an absolute science must have. On the monadic principle we have real unity, for the monad is indubitably real; and this unity is consistent

with real plurality, for the universe of monadic activity is the rational monad's interpretation of its privately-owned perceptions. Mind with all its potentiality is on the monadic principle present from the first, we have not to account for its origin, we have only to make the nature of its various modes of activity explicit.

I will now attempt to apply this principle to the interpretation of the nature of intelligence.

The dominating concept of modern science is evolution. There are at the present time two leading philosophies of evolution, based on antithetical metaphysical principles. One is the theory of creative evolution, the other has adopted the descriptive term emergent. The theory of creative evolution is that the various forms of life, generic and specific, are the expression of a force or impetus or push working against an obstacle and incessantly creating new means of overcoming it. According to its metaphysical principle, life and matter are not a dualism, for the obstacle, matter, is conceived as a self-limitation of life, and the whole universe, as in Leibniz's system, is activity. There are no things, there are only actions. Movement alone is real. The immobile is appearance, an aspect of movement. The theory of emergent evolution, on the other hand, is that life and mind have emerged as new qualities at particular stages of a cosmic evolution. To go behind the fact and explain why and how is impossible and the theory discourages the attempt. What is essential is that the simple is regarded as existentially prior to the complex, the primordial reality being sometimes described as space-time, sometimes as pure motion. It is movement which, as in Descartes's theory, generates the world, but the emergent theory does not put forward a scientific explanation of this generation and in this respect compares unfavourably with Descartes's *Principia*.

There is one significant fact which it seems to me the emergent theory, in common with most scientific theories, ignores. It is



that life is not a phenomenon of cosmic evolution. There is not the slightest evidence, nor any scientific reason for believing, that life emerged at any stage of the evolution of the earth from its presumed original gaseous condition to its present solid shape and constitution, or that it arose as a new quality when some particular chemical combination occurred in the earth's natural laboratory. Life is a phenomenon of the solar radiation. This planet is merely the stage of its activity. The earth does not provide life with its energy. Life is an activity which intercepts and re-distributes solar radiation. If we follow physics and chemistry and imagine the present state of the earth to be the outcome of an orderly cosmical evolution, life is not a stage of that evolution. It belongs to a different evolution altogether and one which has no obvious or necessary connexion with it.

The importance of this fact in connexion with the nature of intelligence is fundamental. Life and mind present themselves, or emerge if we prefer that term, not as new qualities of matter, but as purposive activities within a clearly circumscribed domain. They do not qualify matter, they find it and use it for their own purposes. They have no hold on the energy which science tells us is locked up in the molecular and atomic systems, they are concerned only with the capture, imprisonment and release of the energy which the earth's surface intercepts from the sun. The amœba, if it was the first creature to pullulate in the earth's slime was not a product of the slime, it was the first active response to the stimulus of the solar radiation. Its activity consists, not in a new chemical compound, but in the contriving of a diversion of the flow of solar energy.

It is the characteristic purposiveness of life and mind and the fact that living activity is confined to a definite, limited sphere, which gives the clue to the interpretation of the nature of intelligence. On the emergent principle scientific explanation of knowledge and of intelligent activity based on knowledge are

clearly impossible. Any definitions the emergent theory can offer of knowledge and intelligence are necessarily circular. If mind is a new quality there is no alternative but to accept it as what it purports to be and describe it for purposes of identification in discourse as best we can and invoking its aid. No such impasse confronts us if we adopt the principle of creative evolution. According to that principle intelligence is human nature and not at any point separable from it as a detachable quality. It is the mode of activity which has its structural counterpart in the human organic constitution. The knowledge man possesses or can possess is relative to his needs and to the range of his actions. The intelligence man uses appears in the attitude he assumes to the preparing action, the mode by which his specific actions are carried out, and especially his manner of presenting his actions and the end to which they are directed in their idea independently of their actuality. Intelligence is not a kind of stuff, nor is it a quality, nor is it an endowment. It is not something a man has acquired, but like everything which appertains to the living it is a product of creative evolution, an evolution which has not had to wait on circumstances for some chance novelty to emerge and establish itself, an evolution which has worked and continues to work integrally. Nature does not evolve the structure and function, which we distinguish analytically and assign to distinct categories, independently of one another.

The world assumes an entirely different aspect when we bring this principle to its interpretation. The objects of knowledge are not things in themselves, revealed to an innocent mind contemplating them in their pristine simplicity. The world we know is a human world, a world which only exists in its relation to human nature, a world relative to human modes of apprehension and to the human range and form of action. Moreover, this is not a purely philosophical speculation, it is a principle of the highest significance and importance in physical

science, as recent mathematical discoveries have proved. To take one illustration only—an incandescent body reaches its maximum luminous intensity when its temperature approaches  $6,000^{\circ}$ . Many stars have a temperature immensely higher. The sun's photosphere has this temperature of  $6,000^{\circ}$  and the hotter stars are not more luminous. How would the emergent theory deal with a fact like this? It could only describe it as a coincidence, a peculiarly lucky one, like the coincidence between great towns and navigable rivers. For the creative evolution theory such a fact is interpretative. Sunlight is the essential condition of terrestrial life and that living forms should be contrived to find in it the greatest possible luminosity is exactly what might be predicted a priori.

Can we then explain, in the scientific meaning of explanation, the nature of intelligence? The idea of explaining intelligence is self-contradictory if we can only know mind by immediate enjoyment as some realist theories maintain. If my principle is right, intelligence is only one of many modes of conscious activity. There are two other modes, reflexes and instincts, we can study scientifically. We can do so because we are what Leibniz called apperceiving monads. By reflective self-consciousness we survey the whole scheme of our existence. The great mass of our internally directed actions are organic reflexes in which consciousness not merely does not function, but appears to be designedly suppressed. The major part of our outwardly directed actions are instinctive, carried through automatically without reflexion. Our characteristic mode of responding to stimulus is intelligent and in intelligent actions consciousness functions and is essential. We express this by saying that we know what we are doing. Intelligence proceeds by the idealization of reality. We create for ourselves images and concepts. In doing this we are not creating the universe, nor even fashioning it to the human pattern. By thinking we bring nothing into

existence. The human world, like the human mind-body, has been formed by a racial and generic evolution before its actualization in our individual lives. Yet the images and concepts we create have an existence of their own, they are not copies or pictures of things, just as words and symbols are not copies of the objects they refer to. By this idealizing we introduce deliberation into our actions and by doing so we are able to increase their range and effectiveness to degrees which so far as appears to us have no limit.

I will conclude this summary of the theory that intelligence, with its objective counterpart knowledge, is not a new quality which has emerged at a definite stage of cosmical evolution, but is itself the outcome of a creative evolution and is capable of being scientifically explained, by answering briefly and unambiguously the question which arises naturally whenever the theory is formulated. What is the reality out of which the human world is fashioned? Or, more particularly, what can exist independently of our activity in perceiving and conceiving and be itself independent of the form of our perceptions and conceptions? My answer is the world of monadic activity. The monads are things in themselves. Let me take a concrete example,—this object now before me, an actual object, this particular olive tree, will it not, should I die and all my perceptions and thoughts be non-existent, still spread out its leaves to the sun and continue all the processes of inflorescence and ripening fruit and all its activities? Will it not continue to do so though no mind, mortal or immortal, finite or infinite, exists to contemplate it? The answer seems to me definite and clear. There is an aspect of the olive tree's existence which cannot by its nature gain entrance into my world. For me it can only exist in the form which my perceptions give it, its in-itself existence I can only refer to by metaphor from my own consciousness of the nature of my own existence. What the olive tree's activity is, viewed from its own individual standpoint, having its own individual outlook, I cannot know, but I must

concede to it existence. The alternative theory is that the sense-data which constitute or occasion my perceptions of the olive tree are themselves non-mental and therefore may exist independently of any perceiver, a theory which appears to me the nearest approach to nonsense in modern philosophy.

To sum up, my thesis is :

1. Intelligence is not enlightenment. It is one of several modes of conscious activity. It is the characteristic mode of specifically human action. It is a process of idealizing reality, imaging and conceiving the means and end and form of actions to the end that the actions may be deliberate.

2. Life and consciousness have not emerged in the process of cosmic evolution from simpler existents on the occasion of complex chemical or other combinations.

3. Life and consciousness are not the outcome of cosmic evolution at all. Cosmic evolution is the aspect which degrading energy presents when viewed from the human standpoint.

4. Life is a phenomenon entirely associated with solar radiation. It is not force in any physical meaning and it is not a form of solar energy. It is an activity which by directing the energy it finds already in existence makes it subservient to ends of its own.

5. Intelligence and all other modes of conscious activity are implicit in life from the outset. They are brought into existence by life's creative evolution.

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II.—*By* A. WOLF.

THE multitude of meanings of the term intelligence makes it highly improbable that any three people asked to write about it would really discuss the same thing. In this case it seems certain that we shall *not*. For I have the advantage of having read various accounts of intelligence given by my two colleagues in this symposium, and it is clear to me that we mean different things. This would be a bad start, or even fatal, for an ideal symposium. But actual symposia appear to be more or less notorious for cross purposes. And this one may have a certain advantage inasmuch as we realize from the start that we are considering different things.

Prof. Carr, if I understand him rightly, really meant us to discuss (a) the nature of intelligence, and (b) its metaphysical implications. He himself appears to be especially interested in the second of these problems, to which he devotes the greater part of his contribution. If I deal mainly with the first of these problems it is due to the fact that the solution of the second problem clearly depends on the answer to the first, and unfortunately I cannot accept Prof. Carr's conception of the nature of intelligence. A number of psychologists have frankly admitted that they do not know what intelligence is; and some have even gone so far as to say that they don't care. It is true that an enormous amount of work has been carried out in connexion with so-called intelligence tests, a great deal of it by these very psychologists. But then a man never goes so far as when he does not know where he is going. In any case, I do not propose to deal with any of the numerous conceptions of the subject. A brief survey of the various conceptions is given in Prof. Spearman's

book on *The Nature of Intelligence*, and maybe he will deal with some of those views in his contribution to this symposium.

I turn to the problems set to me. First (a) what is the nature of intelligence? Under the awkward circumstances just indicated, this question resolves itself into a number of separate questions, namely (1) What do I mean by "intelligence"?; (2) Is there anything corresponding to my meaning? and (3) Is it desirable to call it intelligence? I do not propose to deal with questions (2) and (3). My answer to (1) will make it sufficiently clear that I would answer (2) and (3) in the affirmative. But that does not dispose of them, and they are certainly relevant.

Presumably, within certain limits which I do not intend to trespass, one is entitled to use a term in any meaning he chooses, provided he makes that meaning clear. For that reason, none of us is entitled to complain against the others for using the term intelligence in a different sense. Now, what I mean by intelligence is *the capacity to apprehend connexions, causal or logical*. I do not wish to stress the term "capacity." It is not my intention to raise the question of capacities and faculties. We only know mental capacities by their manifestations in actual processes. For my part I should be content to regard intelligence as one aspect or function of mind. In any case "intelligence" raises no peculiar problem in that respect. Whatever answer is found satisfactory to the question of the relation of sensibility or memory, etc., to mind, will also be applicable to intelligence. My main point at present is simply this, I associate the word intelligence with the process of *apprehending connexions*. The verb corresponding to intelligence is "to understand," which for me is the same as "to apprehend a connexion." We must not forget, of course, that the verb is used in almost as many different senses as the noun.

To make my meaning clear it may be desirable to distinguish it from another with which it may be confused. Several psycho-

logists have defined intelligence as the apprehension of *relations*. That definition comes nearest to mine; but it is different from mine—it is much wider than mine. I do not say that it is wrong, only that it is different. Connexions are, of course, relations; but not all relations are connexions. By connexions I mean causal or logical relations, or relations of causal or logical dependence, as distinguished from the simpler spatial or temporal relations, or the simpler relations of similarity or of difference.

It may be as well to indicate some of the initial differences between my view of intelligence and the views of my partners in this symposium. As I conceive it, intelligence is a cognitive function which, in so far as it is successful, results in knowledge. Prof. Carr's view is different, if I am not mistaken, for he insists that "intelligence is not the possession of knowledge but the using of knowledge." (It is possible that Prof. Carr is really thinking of "an intelligence" in the sense of a spiritual agent.) In my opinion intelligence presents no special problem or peculiarity as regards its expression in behaviour; it is just a part of the general problem of ideo-motor action. The more relevant problem in this connexion is not how intelligence finds vent in action, but how to differentiate the behaviour which is the expression of intelligence from other kinds of behaviour, in cases where the external action of a being is our only clue to his mentality. I would suggest that only such behaviour is evidence of intelligence as implies some grasp of connexion between the facts of the situation. But such a rule is more easily formulated than applied. However, this problem is only of secondary interest when we want to ascertain what intelligence is, unless one is a behaviourist, which I am not. My view is also different from that of Prof. Spearman. While we are agreed about the cognitive character of intelligence, Prof. Spearman makes intelligence synonymous with *cognition*, whereas I would identify it with only a special kind of cognition, namely, the *cognition of connexions*.



By intelligence, then, I mean the capacity to apprehend connexions. And connexions must be distinguished from other kinds of relations. This distinction may need further elucidation. There are simpler relations of space and of time, of similarity and of difference, the cognition of which seems to call for the supposition of no special mental processes other than those involved in ordinary perception. The same processes which render possible the perception of, say, two patches of colour, or of two events, may also account for our apprehension of their concrete spatial and temporal relations, and of their difference or their similarity. The assertion is open to criticism. But my main point here is that causal and rational *connexions* cannot as a rule be *perceived*, in the sense in which the simpler relations of space and time, and of similarity and difference are perceived; and that the process of apprehending connexions is much more different from the process of perceiving ordinary objects and events than is the process of perceiving their simpler relations of space and time, of difference and likeness. These simpler relations are *given* along with the *percepta*, in a sense in which their *connexions* are *not given*, but have to be surmised, unravelled. The detection of connexions is a process characterized by greater spontaneity or original activity than is any other kind of cognitive process, if the cognitive processes compared are of approximately the same degree of development.

Intelligence is dependent upon all other cognitive functions—sensibility, memory, imagination, etc. It seems to me comparatively easy to distinguish it analytically from them, but it cannot function apart from them. This last fact may account for the tendency of “intelligence tests” to branch out into a multitude of other mental tests, and the consequent temptation to make “intelligence” synonymous with “cognition,” as Prof. Spearman does. Moreover, as is perhaps already implied in what has just been said about the dependence of intelligence upon

all the other cognitive functions, the successful functioning of intelligence must depend in large measure upon the extent of our familiarity or acquaintance with the objects whose connexion is to be discovered. Hence the failure of many intelligence tests, which seem to assume a kind of universal intelligence. The ordinary mortal is familiar with only a very limited range of objects, and the successful working of his intelligence is restricted to that extent. Proper intelligence tests must take into account this natural limitation.

My conception of the relation of understanding to some other cognitive processes may need an illustration or two. The spatial collocation of the various parts of a puzzle, or of a lock, may be clearly seen, and yet their connexion may not be grasped. A schoolboy may see quite clearly, or find out by measuring, that a certain triangle is both equilateral and equiangular, but he may not apprehend the connexion between them. One may even learn by heart the proof of the proposition in question, remembering the meaning of all the words, and their precise sequence, but fail to grasp the actual connexion which the proof is intended to elucidate. In all these and similar cases it is comparatively easy, I think, to see the difference between, on the one hand, perceiving, remembering, imagining objects and some of their spatial and temporal relations, and, on the other hand, grasping their connexions.

Incidentally I may draw attention to a serious defect in certain modern methods of teaching geometry by empirical measurement alone. To teach accurate measurement is a very good thing; but it is not a substitute for demonstration. Measurement can only show co-existence, not connexion. To learn geometry by measurement alone is only a little better than taking it on trust or on authority. This reminds me of a story told of a boy who had great difficulty with the Pythagorean theorem. After several vain attempts to understand it, he

turned to his master and asked : " Please, sir, was Euclid an honest man ? " " Yes," replied the master. " Well, sir, can we not take his word for it that the squares on the two sides really are equal to the square on the hypotenuse ? " That is another way of learning a relation, without apprehending the connexion.

Having distinguished between the apprehension of connexions and the perception of other relations, it may be advisable to prevent a possible misapprehension. Although these processes are, I maintain, distinct from the point of view of analytic psychology, I am nevertheless prepared to argue that *genetically* the apprehension of connexion grows out of the perception of simpler spatial and temporal relations. That is to say, the mind begins with the appreciation of the relations *cum hoc* and *post hoc*, and afterwards distinguishes those of them which are also *propter hoc* from others which are not. This transition may be seen to some extent in certain experiments with anthropoid apes. Let me quote one of Köhler's experiments with a chimpanzee (Sultan). " A long thin string is tied to the handle of a little open basket containing fruit : an iron ring is hung from the wire roof of the animal's playground, through which the string is pulled till the basket hangs about two metres above the ground ; the free end of the string, tied into a wide open loop, is laid over the stump of a tree-branch about three metres away from the basket, and about the same height from the ground ; the string forms an acute angle—the bend being at the iron ring. Sultan, who had not seen the preparations, but who knows the basket well from his feeding-times, is let into the playground, while the observer takes his place outside the bars. The animal first looks at the hanging basket, but soon shows signs of lively agitation, on account of his unwonted isolation. . . . After a time, Sultan suddenly makes for the tree, climbs quickly up to the loop, stops a moment, then, watching the basket, pulls the string till the basket bumps against the ring in the roof, lets it go again,

pulls a second time more vigorously, so that the basket turns over, and a banana falls out. He comes down, takes the fruit, gets up again, and now pulls so violently that the string breaks, and the whole basket falls. He clammers down, takes the basket, and goes off to eat the fruit." (*The Mentality of Apes*, by Wolfgang Köhler, translated by Ella Winter, pp. 8 f.)

Inference from a monkey's behaviour to its mental experiences is bound to be precarious. But it looks as though the monkey, perceiving the spatial relation, that is the spatial continuity, between the rope and the basket of bananas, passed to some dim apprehension of their connexion, and acted accordingly. Whether or no this be the correct interpretation, it certainly is true that even in the highly advanced phases of its development, intelligence, in its search for connexions, takes as its clues the perception of other relations. *Cum hoc* and *post hoc* are not the same as *propter hoc*, hence the familiar fallacies; but it is mainly with the aid of *cum hoc* and *post hoc* that we discover the *propter hoc*.

Whatever the evolutionary history of intelligence may be, it certainly varies enormously in two respects, namely, in respect of degree, and in respect of range. As regards degrees of intelligence, there must be innumerable grades between the dawning intelligence of, say, a chimpanzee, or an infant, with its very dim quasi-feeling of connexion or dependence of some kind, and the explicit consciousness of the precise nature of a connexion, such as is experienced, say, by men of science and other intellectual people. The intelligence of one and the same mind, however, may exhibit very different stages of development with reference to different realms of objects. Along with differences of explicitness or consciousness there go also differences of "freedom," that is to say, differences analogous to those between "tied" and "free" images. In the less developed stages of intelligence the connexion is, so to say, tied to the terms of

the connexion, or fused with them. Perhaps the nearest approach to a *perception* of connexion or dependence is to be found in experiences of hanging, say, from a branch or a rope, and of dragging or being dragged. (For the genetic psychology of intelligence the etymology of the words "dependence" and "connexion" may be significant.) In the more developed stages of intelligence the connexions are distinguished from their terms, and considered apart with sufficient detachment to try and fit one conceivable connexion after another to the same terms (as happens, for instance, in the case of rival hypotheses). Sometimes, indeed, intelligence may almost run to seed (if I may say so), as when certain types of clever people elaborate all conceivable connexions without troubling at all about the reality of the terms. (Incidentally, I may be permitted to remark that I should like to restrict the term reason, but not inference, to the higher, more explicit forms of intelligence.) Again, intelligence varies also in respect of the range of facts which it colligates. A chimpanzee, *e.g.*, may only be able to apprehend dimly the connexion (or rather perhaps vaguely feel that there is some connexion) between a very few facts composing one concrete situation; a perfect intelligence might apprehend the connexions between all connected things, etc., throughout the universe. Obviously, there are innumerable intermediate grades possible. The difference, *e.g.*, between a superstitious man and an enlightened man of science is, I think, very largely a difference in the range of facts the connexions of which they realize. And even highly intelligent people sometimes construct very simple philosophies by quietly ignoring a vast mass of inconvenient facts. That there is a correlation between *degree* and *extensiveness* of intelligence seems probable; but, if so, it may be due to the fact that a higher grade of intelligence makes it easier to take interest in a more extensive range of facts than is within the reach of a lower grade of intelligence.

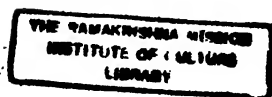
I must turn now to the brief consideration of the second main question, (b) the philosophical significance of intelligence. Reflections on the nature of what I have described as intelligence has led to some curious results of an epistemological character. The names of Hume and Comte, Kant and the Idealists, Nietzsche and Vaihinger, and many others will readily occur to one in this connexion. But it is neither necessary nor possible to discuss here the history of the subject with the necessary brevity and accuracy. A bare indication of certain extreme tendencies must suffice. On the one hand, it has been argued that since connexions are not *perceived*, but apprehended by a spontaneous activity of the mind, therefore there are no connexions in nature, and science should consequently confine itself to the description of mere collocations and sequences. The belief in connexions, especially causal connexions, has been condemned as a survival of the belief in occult powers, etc. Some have gone so far even as to maintain that the orderliness which human intelligence reads into nature is a kind of veil of Maya, a kind of artistic delusion helping to make human existence tolerable. Others, again, have drawn from the same data the conclusion that intelligence (or better perhaps "Intelligence," with a capital, a kind of universal Intelligence of which finite intelligences are but "modes") plays a supreme rôle in the orderly constitution of Nature, conferring on Nature its most significant character, converting in fact what would otherwise be a chaos into a cosmos. None of these extreme tendencies appeals to me. The only probable conclusion, of an epistemological character, which seems to me inferable from the nature, development and survival of intelligence is, that there really are connexions in Nature, though Nature may not be orderly through and through. Even if it is admitted that intelligence is primarily an instrument of life, it seems to me to be more reasonable to suppose that intelligence discovers real connexions, a knowledge of which is consequently

helpful, than that it creates useful delusions. Intelligence, like every other cognitive capacity, may be selective, because prompted by the needs of the living organism. But the connexions apprehended may be perfectly real even if they are only a very small sample of the whole.

Ontologically likewise there have been extreme tendencies more or less parallel to the above-mentioned epistemological tendencies. On the one hand, there has been the tendency to minimize, if not to explain away altogether, the significance of mind in Nature. On the other hand, there is the tendency to make mind not only the more important part of reality, but the sole reality. The latter tendency appears to be favoured by both my partners in this symposium. They may be right, but their arguments do not appear to me to support their views in this respect. Prof. Spearman appears to reduce the whole world to mental experiences, on the ground that the intervention of nervous processes between the alleged physical stimuli and cognitive consciousness must render impossible a correct knowledge of physical objects, even if there were such things. But surely if we can know nothing about physical objects, then we can know nothing about nerves and nervous processes, and then the whole argument breaks down. If, on the other hand, we do have a knowledge of nerves and nervous processes, why should all other physical objects be unknowable? Prof. Carr's views and arguments are not sufficiently clear to me to enable me to deal with them briefly. So I will conclude by indicating, in as few words as possible, what appears to me to be the ontological significance of intelligence. I do not think that *any* cognitive capacity or process can be adequately explained on purely mechanistic lines. But however plausibly the other cognitive processes may be explained mechanistically (I mean in ways associated with such terms as *impressions*, *traces*, *composite photography*, etc.), intelligence so obviously involves spontaneous mental activity that a

mechanistic explanation of it cannot possibly be made to appear plausible, I think. I would conclude, accordingly, that the nature of intelligence is such as to vindicate for mind a place in the world of ultimate reality, as being something more than a mere epiphenomenon. But that is a very different thing from claiming for mind or spirit the monopoly of reality. On the contrary, it seems to me that intelligence itself, as we know it, posits a physical world. Prof. Carr appears to hold that to posit a substantially distinct matter as well as mind would make knowledge a *miracle*. But without a physical world "knowledge" would be a *sham*, and intelligence would appear to stultify itself. After all, knowledge *is* something wonderful, and not the only wonder by a long way! A miracle more or less, what does it matter? Better a miracle than a mirage.

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III.—*By C. SPEARMAN.*

HAVING had the temerity to accept Prof. Carr's kind invitation to take part in this symposium, I feel at least bound to confess forthwith my unambitious aim. The first and second contributions attempting to advance our positive knowledge about intelligence seem to me to have only brought this very controversial matter into deeper confusion; a third one may well be satisfied if, instead of trying to settle which of the contending schools is in the right it succeeds in making clear what these respective disputants really mean to assert.

This applies in especial degree to the view of Prof. Carr. None is so interesting, but also none is so baffling. Indeed, the paper which he has just contributed is for myself—no doubt, by my own fault—not unlike a brilliant fascinating missing-word puzzle! I get along with it fluently enough until each encounter with the term “intelligence,” and then I know not what idea to put behind this. The paper is as a casket containing treasures of thought tantalizingly locked up. And I am cherishing hopes that at this meeting he is going to tender to us the key.

Prof. Wolf's contribution, I am relieved to find, appears to lie more within my grasp. Passing over the great bulk of it, with which I am in full agreement, the following are the chief points on which I should like elucidation. First of all, although no possible ground exists for reproaching his definition of intelligence with want of lucidity, can the same be said in respect of propriety? He urges that “one is entitled to use a term in any meaning he chooses, provided that he makes this meaning clear.” But this is a hard saying. A word may possibly be, and “intelligence,” I believe is, so encrusted with age-long associations

that these can no longer be severed from it by any such arbitrary stroke. Further, a word may have amassed such a wealth of prestige, that to seize it for any novel usage becomes an appropriation of property. Indeed, the trouble about this intelligence may perhaps have its deepest source in the subconscious endeavours of each writer to secure the glory of the title for his own favourite view. In fairness, then, all the claimants to the title must be heard, before it can be allowed to any one of them. And, in view of these circumstances, I feel almost aggrieved at the remark of Prof. Wolf, that for me the word denotes all cognition. In point of fact, I had taken an infinity of pains to avoid claiming the word at all.

Passing from terminology to the actual facts, Prof. Wolf's main position seems to consist in asserting that the human mind has the power to cognize the relations of causality and of evidence, and, furthermore, that these are characterized by certain fundamental differences from all others; in particular, they cannot be directly *perceived*, and their detection entails *spontaneous activity*. Now, as to the existence of the power to cognize these relations I, of course, unreservedly concur; they are, in fact, two out of the ten which I had enumerated myself. Moreover, these two are, no doubt, conspicuously important in the kind of work to which he has specially devoted himself. As regards the distinctions made from all the other kinds of relation, I am not yet quite clear as to how much he means to assert; direct perception and spontaneous activity are "kittle" concepts, any way.

Turning to the genesis and nature of our awareness of material objects, here I am afraid that there do exist some serious discrepancies between us. But for the present I must content myself with remarking that his criticism of my position has mistaken its point; the real existence of such material objects as are portrayed by the senses was never implied by me to be a fact, but only posited for the purpose of a *reductio ad absurdum*.

However, in raising this subject at all, he and I are perhaps digressing from our proper topic—already more than large enough for any single meeting—and straying into one that is incomparably larger still. I look forward to the pleasure of discussing sensory perception with him on some subsequent occasion.

There remains one more remark of his that cannot be passed over in silence. He alludes to "proper intelligence tests," which would seem to mean tests of the power to cognize relations of causality and evidence. Here, the question must be asked as to whether any such power can be genuinely tested at all. Experience has shown that if two tests are given in respect of the relations of causality and of evidence respectively, most persons will do markedly better in the one than in the other. In what way, then, shall any balance be struck between them? How much causality is worth how much evidence? Even if two tests are given in different branches of one and the same class of relations—as, say, physical causality and mental causality—they do not in general yield equal results for the same individual; and such subdivision might be continued to any extent, till eventually we seem obliged to admit that every idea may involve a separate cognitive power, or system of powers, on its own account. Would Prof. Wolf suggest striking an average? This is mathematically impossible without equivalent units, and no such appear to be forthcoming. Shall recourse, then, be had to the device of sampling? This, if it is to be genuine, makes all the requirements of averaging (including equivalent units) and others into the bargain.

Passing from Prof. Wolf's views to those of the school represented by myself, my purpose is once more not so much to convince anybody else, or even to let them convince me, as to *narrow the issues*. For us all, it seems a matter of scientific urgency to settle just where we agree to differ. Time and again, other authors have set up in opposition to myself doctrines that, in

truth, have been substantially my own, but expressed much more vaguely and regarded from a slightly different angle. Here may be put some of the recent writing on "shapes," "structures," etc.

Now, the main position held by us is that there exist three and only three processes, by means of which the human mind can possibly either know truth or generate novel cognitive content; these two great powers seem to be absolutely coextensive. I regard my position as contradicted, either by any person who denies that one or other of these three processes really occurs or by any one who claims to find a case not falling within their scope. They have been formulated as follows:—

- (1) A lived experience evokes immediately a knowing of its characters (and experiencer?).
  - (2) The presenting of any two or more characters (simple or complex) evokes immediately a knowing of relation between them.
  - (3) The presenting of any character together with a relation evokes immediately a knowing of the correlative character.
- (2) and (3) are called the processes of "eduction."

Alongside of these processes which generate all *new* cognitive content may be placed that further process which is limited to evoking *old* content; in other words, reproduction.

The second main position held by our school concerns individual differences of ability. Certain conditions have been specified under which, and solely under which, any measurements of different abilities can be divided into two parts, such that one is common to all the abilities, whilst the other is specific to each. To preserve theoretical neutrality, these two factors have been denoted by the letters *g* and *s* respectively. The discovery of the conditions for such divisibility has been supplemented by determining just how much irregularity must be expected to arise from what are known as the errors of sampling; by these are

meant the errors that derive from testing only a finite number of persons. Up to this point, the theory is still altogether within the region of mathematics.

Next, we have found that the said conditions do approximately hold for all kinds of ability so far submitted to test, and that the degree of approximation agrees closely with that which must be expected from the sampling errors, so that no deviation remains over to be explained in any other way. For this purely empirical part of our position a great array of evidence has been accumulated and will shortly be published.

There remains still untouched, however, the question as to what real entity or system of entities underlies this value  $g$ . Here, the confidence with which we are prepared to defend the two theorems, both mathematical and empirical, can no longer be maintained. At present, we are only accumulating facts by slow degrees. Of these a few may be mentioned that seem specially to bear on the topic of the symposium and the remarks of the previous speakers :—

- (1) This  $g$ , unlike the faculty of perceiving relations of causality and evidence, does admit of genuine measurement.
- (2) It has been found markedly present in all cognitive operations which depend essentially upon the ~~two~~ processes of education. The relations of causality and of evidence show no superiority over the others.
- (3) In the processes that depend rather upon reproduction, the amount of  $g$  is far smaller, if not altogether dubious.
- (4) In no process, even such as are commonly taken to represent the highest exercise of reason, does this  $g$  appear to reign alone. There is always some amount of  $s$  present; that is to say, a factor that varies independently from one process to another.

- (5) This and many other points of analogy have led to the suggestion that, for heuristic purposes at any rate, the  $g$  may be regarded as indicating a "mental energy," whereas the variations of  $s$  represent so many engines into which this may be directed alternatively.
- (6) In spite of the great doubt which still exists as to the nature of the entity measured by  $g$ , nevertheless this entity is not thereby rendered equivocal. It consists in precisely that which is common to all the processes where  $g$  has been or may be actually found. Though not determined by analytical definition, it is so "objectively."
- (7) Throughout, no attempt has been made "to assume" any ability whatever, much less a "universal intelligence." Not an assumption of  $g$  has been offered, but a demonstration. As for the term "intelligence," we can so far assert only that upon  $g$  are founded the ordinary general *estimates* that one man makes of another and puts under this name.
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## II.

SECOND SESSION : *July 25th, 1925 at 10 a.m.*

*Chairman* : PROFESSOR G. E. MOORE.

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SYMPOSIUM: THE CONCEPT OF ENERGY.

C. R. MORRIS AND DOROTHY WRINCH.

I.—*By* C. R. MORRIS.

It will be well at the outset to distinguish between the conception of force and the conception of energy. Professor Soddy, in his book on *Matter and Energy*, says : “ In dealing with actual cases of motion in the heavens and earth, Newton fell into the common error of his day. He imagined causes to exist for the departure of these motions from the natural or simple law, and it has taken science three centuries to recognize that the causes imagined are not real causes and that they only describe the effects, without any more light on the origin of these effects. The imaginary cause of change of motion Newton defined as Force . . . . Whenever the motion of matter departs from the simple law, appropriate forces have been imagined to exist . . . . *e.g.*, atoms of matter are regarded as attracting or repelling one another with the force of chemical affinity, a phrase which makes every thinking man shudder. So has grown up the preposterous notion that forces really exist and are the permanent attributes of masses of matter, molecules, atoms, electricity, etc. . . . This is not the proper view to take. It is true that in the science of mechanics, where gravitation is the dominating phenomenon, it is convenient. But the conception of force and its pseudo-physical reality undoubtedly delayed for centuries the recognition

of the law of the conservation of energy. Only what is conserved has the right to be considered a physical existence" (p. 106).

Thus a new era is supposed to have dawned for science when the conception of energy came into its own. The old conception of force provided a purely imaginary hypothesis which covered a difficulty with a word without throwing any light on the explanation of the difficulty. The case with energy is different: this concept does not offer an imaginary answer to the question "What causes bodies to move?" It is meant to answer a different question, and its answer is not imaginary but experimentally verifiable. It satisfies us that underneath all physical and chemical changes there is something which remains quantitatively the same, viz., energy. And because it always remains quantitatively the same it is said to have physical existence.

What then is energy? In accordance with the foregoing we shall reply that "Energy is that which remains quantitatively the same throughout all changes." This definition seems to be sound, and, as we shall see, it plays an important part in scientific method; but it is not, of course, this definition that we are really asking for. If it is claimed that the principle of the conservation of energy is experimentally verifiable, or indeed if it is to be of any practical value in scientific inquiry, energy must be such that it can be recognized when it is met with. What then is energy?

At first sight the answer seems simple enough. Energy is usually defined in terms of Work. "Work is the act of producing a change of configuration in a system in opposition to a force which resists that change. Energy is the capacity for doing work." (Maxwell, *Matter and Motion*, p. 59.) This energy is said to be conserved: that is to say, energy cannot come into being or disappear. If work be done on one body by another, the amount of energy received by the body affected is precisely equal to the amount expended by the body acting: the sum



of energy possessed by the two bodies remains the same throughout.

Energy is said to be of two general kinds—Kinetic and Potential. If a body is moving, it has, at any moment, kinetic energy equal in amount to half the product of its mass into its velocity squared. In practice this energy is being used to overcome friction, air-resistance, etc., and it may also of course be utilized for doing other work—e.g., drawing with it other bodies, turning a windlass, etc. Kinetic energy is the fundamental form of energy. “When we have acquired the notion of matter in motion, we are unable to conceive that any possible addition to our knowledge could explain the energy of motion, or give us a more perfect knowledge of it than we have already.” (Maxwell, *Theory of Heat*, p. 201.) Kinetic energy is thought of as perfectly intelligible.

Potential energy is not quite so simple. “Men of science, so far from feeling that their knowledge of potential energy is perfect in kind and incapable of essential change, are always endeavouring to explain the different forms of potential energy . . . . The progress of science is continually opening up new views of the forms and relations of different kinds of potential energy” (p. 302). If a body is raised ten feet above the ground, it is said to have potential energy proportional to its height: that is to say, unless work is continually done on it by some external body, it will, by virtue of its position, fall and develop kinetic energy. This energy can of course be utilized when transformed into kinetic energy, e.g., as falling water is used in a mill-wheel.

The principle of the conservation of energy then asserts that there is always in existence the same total quantity of energy, though the amounts which are at any moment in the potential or the kinetic form may vary indefinitely. Generally speaking, when work is done some energy is being transformed from one

form into another : that is to say, there is not, generally speaking, the same amount of energy *of the same kind* before and after doing work. In the case of all kinds of energy *except one* the lowering of potential energy of any kind involves a loss of energy of that kind ; that is to say, the lowering of the potential necessarily involves the transformation of some of the energy of that kind into energy of another kind. For instance, if work be done in propelling a railway truck along rails, part of the energy is used in overcoming friction and thereby imparting heat to the rails : in other words, part of the energy has been transformed into the form of heat. On the other hand, if heat energy be transferred from one body to another by simple conduction, no heat energy need be lost—that is, no heat energy need be transformed into any other kind of energy. This peculiarity of thermal energy suggests at the outset that the theory of heat is likely to provide special difficulties for the concept of energy. We must therefore pause to consider what is meant when it is said that heat is a “ form of energy.”

At first heat was supposed to be a substance, which was given the name of “ caloric ” ; and it was thought that bodies were hotter or colder in proportion to the quantity of caloric which they contained. But “ the experiments of Rumford on the heat produced by the friction of metal, and of Davy on the melting of ice by friction, have shown that when work is spent in overcoming friction, the amount of heat produced is proportional to the work spent. The experiments of Hirn have also shown that when heat is made to do work in a steam engine, part of the heat disappears, and that the heat which disappears is proportional to the work done. Now, since heat can be produced it cannot be a substance ; and since whenever mechanical energy is lost by friction there is a production of heat, and whenever there is a gain of mechanical energy there is a loss of heat ; and since the quantity of energy lost or gained is proportional to the

quantity of heat gained or lost, we conclude that heat is a form of energy" (p.77.) That is to say, since, when the temperature of a mass is lowered, a certain amount of mechanical energy can be obtained from the process, and a certain quantity of heat disappears, the conclusion is drawn that heat is a form of energy.

Now when the quantity of heat contained by a given mass is diminished, a certain amount of this thermal energy can be utilized for mechanical work; this amount can be determined by calculation, since it is found to be independent of the nature of the substance and of the process used in diminishing the quantity of heat contained by the substance, and to be relative simply to the quantity of heat and to the temperature before and after the diminishing process measured on the absolute scale—*quantity of heat* being determined by the amount of mechanical work required to be done to raise the temperature of a body of a given mass by one degree. It will be seen that the amount of energy available for mechanical work in any given body is relative to its absolute temperature: that is to say, the potential energy of a body in respect of its heat is relative to its temperature, just as the potential energy of a body in respect of its position is relative to its height.

These considerations lead us at once to the second law of thermodynamics, sometimes known as the law of degradation of energy, which asserts that perpetual motion is impossible in a heat engine. When a body is heated by having work done on it the whole of the mechanical energy may be transformed into thermal energy: but when the heat given out by a body is used to do work, only a certain proportion can be transformed into mechanical energy. That is to say, when energy passes into the form of heat, a certain proportion is inevitably finally lost for mechanical purposes. Moreover, if we suppose all the bodies of a system to be at a given uniform temperature, that system has no energy available for mechanical work since the

potential cannot be lowered : yet it is said to have potential energy proportional to its absolute temperature. " W. Thomson (1852) accordingly drew attention to the fact, that in all non-reversible, that is in all real thermal processes, quantities of heat are lost for mechanical purposes, and that accordingly a dissipation or waste of mechanical energy is taking place. In all cases heat is only partially transformed into work, but frequently work is wholly transformed into heat. Hence a tendency exists towards a diminution of the mechanical energy and towards an increase of the thermal energy of the world." (*Mach, Popular Scientific Lectures*, p. 175.)

We are now faced by an apparent contradiction. If the heat in the world increases in proportion as the capacity for doing work decreases, is there any sense in saying that heat is a form of " energy " ? " If we look at the matter in an unprejudiced light, we must ask if there is any scientific sense or purpose in still considering as energy a quantity of heat that can no longer be transformed into mechanical work (for example, the heat of a closed equably warmed material system) ? The principle of energy certainly plays in this case a wholly superfluous role, which is assigned to it only from habit" (p. 177). We may put our difficulty in this way -if we mean by " energy " the capacity for doing work, then energy is not conserved : if we define energy as " that which is conserved " we cannot mean by it " the capacity for doing work " -it cannot be both.

Here then we have a manifest contradiction. But we must not make the mistake of supposing that by great philosophical acumen we have laid bare an unrecognized confusion of thought in physics and chemistry. The contradiction is as clear as possible in the formulation of the first and second laws of thermodynamics. The first law says that energy is conserved : the second law says that energy tends to degrade itself into the form of heat, that is, it tends to assume a form in which it is

unavailable for mechanical work. It seems to be by rubbing together, as it were, these apparently contradictory laws that science advances. No doubt we might in our naivety expect the physicist to say to himself: "Since I have to give up my idea that energy is the capacity for doing mechanical work, it seems that there is no definite meaning which I can attach to the word 'energy' at all: and therefore I had better give up using the word, and stop talking about the conservation of energy." But in fact, of course, he does no such thing. He first thought that energy meant the capacity for doing mechanical work, but he now sees that it does not mean that, and he could obviously, if he chose, offer us a new definition of energy (perhaps, *e.g.*, by re-defining "work," and distinguishing between "work" and "mechanical work" as a special form of work): and no doubt we should have considerably greater trouble in showing that this new definition would not *quite* do as a definition of "that which is conserved." To speak more strictly, we should have to wait for him to show us himself that it would not do. As observation becomes more organized and instruments more accurate he comes to see that quantities which appeared to aggregate into the conserved total do not quite so aggregate, and that therefore there is a hitherto unrecognized leakage of energy which is transforming itself into a hitherto unknown form. And so the definition of energy has to be widened to include the new form. And so it is that science advances. Instead of giving up the theory of the conservation of energy, the physicist moves on to the theory of heat as kinetic energy, inferring that the energy which does not expend itself in moving the body as a whole must expend itself in giving additional velocity to the movements of the molecules within the body, though these movements of molecules, being random and uncontrollable, are not available for mechanical work. Clearly it is by the discovery of discrepancies of this kind that science always makes its advances: so that it seems natural

to assume that there will always be a discoverable contradiction between the definition of energy and the concept of "that which is conserved."

We may now ask what is the importance for philosophy of this manifest confusion underlying the use of the word "energy." Only if we accept the canon laid down by Professor Soddy and already quoted in this paper is the confusion even of interest to philosophers: "Only what is conserved has the right to be considered a physical existence." This statement seems to involve the old assumption (which is found in Descartes), that physics is simply trying to describe the *reality* which underlies the *appearances* of everyday life. If we accept this assumption, then indeed a contradiction in the first principles of physics is of supreme importance, and is fatal to all the conclusions of physics. For if physics is really claiming to give an account of reality, then, since there can be no contradiction in the nature of reality, the detection of a contradiction in the first principles of physics, reveals physics as being through and through an impostor.

But are we to believe that it is the business of physics to discover for us the real nature of the universe? In my opinion, very few modern philosophers would accept this doctrine. No doubt Descartes assumed it to be true, and it is easy enough to see how he came to think so. He recognized, as we recognize, that simple observation does not provide us with adequate ground for believing anything which can be formulated. If we want to make judgments which are true we must go behind simple observation and use our capacity to infer: clearly it is by inference that true judgments are reached, and there is no other way of arriving at them. Now if inference enables us to arrive at the truth, the real world must be such that it can be inferred about: this must mean, thought Descartes, that we go over again in thought the very process by which the real world was actually made: that is to say, that it is by tracing again in thought the process by

which a thing was actually constructed that we come to see what is the state of that thing at any given moment—and this is the only way to apprehend the present state of a thing, viz., to follow its history by inference—the assumption being that we infer from cause to effect ; or rather that no distinction need be drawn between the relations of cause and effect and of ground and consequence. This view however stood self-condemned by the dilemma which it necessarily involved—either, with the dogmatic school to deny the reality of time, or, with the empirical school, to accept that at least time was as real as anything else, and so to deny the possibility of knowledge.

This latter difficulty was the result of Hume's proof that if we depend on following the historical development of a thing for our knowledge of its present state, then all knowledge is impossible since we cannot infer from cause to effect. We cannot detect any necessity in the historical development of a thing—in other words, argument from cause to effect is not really inference. Hume, of course, drew the conclusion that inference and therefore science was impossible. Since he, like other pre-Critical philosophers, drew no distinction between the causal relation and reciprocal relations, it seemed to him that to show that there was no intuitive insight into causal necessity was the same thing as to show that there could be no insight into necessary relations at all. Kant suspected that this did not follow : he at the outset admitted the soundness of Hume's proof that argument from cause to effect can never be inference, but he saw that most of the argument in the sciences is not causal but mathematical. His analysis of scientific method revealed to him that the procedure of the sciences is the exact reverse of Hume's account : instead of proceeding through the knowledge of historical development to knowledge of a present state it attempts to proceed through knowledge of present states at different moments of time to construct a hypothesis to give an account of historical develop-

ment—that is, in those sciences which are interested in historical development at all. Kant therefore thought that the method of science was worth examining, in order to discover what kind of knowledge it could yield—it having been demonstrated by Hume that if science depends upon following the course of development of the real, its thinking is of no avail, and it will arrive at nothing but arbitrarily classified observations. Yet clearly science is, as we say, “building a system in thought,” and it is by “building in thought,” or by “synthesis,” if you like, that science advances. The conclusion to be drawn from Hume is that whatever else it may be doing science is certainly not “rebuilding the real world in thought,” and its inferences certainly do not depend on having detected the principles of construction of the real world. When a science builds up its system, it is not in any sense “discovering” a system in Reality, and it is difficult to see in what sense it can be said to be “giving an account of” Reality.

This is of course slaying a dog which is already well dead. But the implications of this view do not always seem well recognized. What, we should ask, is science doing? And this question is very difficult to answer in a sentence. Mach seems to be near the truth when he says, speaking of the axioms of physics as set up by Wundt: “These principles might be studied properly enough as fundamental principles of mechanics. But when they are set up as axioms of physics, their enunciation is simply tantamount to a negation of all events except motion . . . . Physics treated in this sense supplies us simply with a diagram of the world, in which we do not know reality again . . . . Intelligible as it is, therefore, that the efforts of thinkers have always been bent upon the ‘reduction of all physical processes to the motions of atoms,’ it must yet be affirmed that this is a chimerical idea. This ideal has often played an effective part in popular lectures, but in the workshop of the serious inquirer it has discharged scarcely the least function. What has really been achieved in



mechanical physics is either the elucidation of physical processes by more familiar mechanical analogies (for example, the theories of light and of electricity), or the exact quantitative ascertainment of the connexion of mechanical processes with other physical processes, for example, the results of thermodynamics" (*ib.*, p. 158).

The truth clearly is that physics demands to be allowed to assume that *something* is conserved. An analysis of the method of science led Kant to the view that "the unity of experience would never be possible, if we allowed that new things (new in substance) could never arise: for in that case we should lose that which alone can represent the unity of time, namely, the identity of the substratum, in which alone all change retains complete unity. This permanence, however, is nothing but the manner in which we represent the existence of things." (*Critique of Pure Reason*. A, 186.) We are required to assume that something remains eternally the same, since it is only on this assumption that thought can work. In the quantity-measuring sciences, we are bound to assume that something remains quantitatively the same, since it is only by assuming this that we can argue from our addition and subtraction; and obviously measurement is only of value in so far as it provides us with data from which we can argue—argument by addition and subtraction of numbers being, of course, not open to doubt. But because we are bound to *assume* that something is quantitatively conserved, does this give us the right to assert that Nature has arranged that this assumption should be correct? Surely it does not: and probably most of us do not believe that the assumption is quite correct. The assumption is made, not because it is believed to be metaphysically sound, but because a departmental need is felt for it. As a fact, Mayer wrote to Griesinger: "If you finally ask me how I became involved in the whole affair, my answer is simply this . . . I discovered the new theory for the sufficient reason that I vividly

felt the need for it." As Mach observes: "The formal need is *first* present, and our conception of nature is subsequently gradually adapted to it . . . . With respect to our formal need of a very simple, palpable, substantial conception of the processes in our environment, it remains an open question how far nature corresponds to that need, or how far we can satisfy it." And in particular with regard to the "substantial notion of the principle of Energy" it appears to have "its natural limits in facts, beyond which it can only be artificially adhered to" (p. 184.)

In other words we may say that what is assumed to be conserved is not really a "thing," and cannot fairly be regarded as a substance. When we speak of a particular thing as if it were conserved, we are in fact saying to ourselves: "Let us suppose that this thing remained eternally the same: what would then follow?" Then we always end by discovering that this "thing" is not really permanent because there are some phenomena not explicable on this hypothesis; but in coming to repudiate the claim of this "thing" we gain further knowledge about "that which is conserved." Thus in assuming this substance to be the permanent, we cannot have been merely wrong, for otherwise we could never have explained anything at all on this hypothesis: yet we cannot on the other hand be quite right, for if so, science would perforce stand still and could never get any further. Science provides us with no ground for believing that we shall ever find anything substantial which is conserved—it merely proves to us that by gradually repudiating the claims of one substance after another we do genuinely develop our knowledge of the permanent or "that which is conserved."

But let us return to physics. Physics, like other sciences, has to assume that something remains eternally the same through the changes which it examines: in the case of physics this assumption naturally takes the form of assuming that something is quantitatively conserved. On this view it is the business of

the physicist—or at least it is a primary necessity to the physicist—to learn to recognize “that which is conserved” in its various manifestations, in order that he may be able accurately to measure it, and add it up so as to discover whether there is some of it which is unaccounted for : in this event, of course, he proceeds to ask whether this is due to careless observation, inaccuracy of measuring instruments, etc., or whether some of it has been transformed into a form which he has not hitherto recognized. He then proceeds to try to determine this by experiment. If then, we may argue, the physicist claims that that which is conserved is “energy,” we may fairly ask him to tell us how we may recognize energy when we meet it. The success of physics seems to pre-suppose that he can recognize “energy,” and therefore that he always means the same thing by the word : and if he always means the same thing by the word, he must *know* what energy is : and if he knows what energy is, he must be able to tell us what it is. But as things are we have satisfied ourselves that he cannot tell us what he means without contradiction : therefore he does not always mean the same thing by energy : and therefore physics is nothing but a sham.

Annihilating fire of this kind has constantly been poured up on the scientist by the philosopher ever since the days of the Academy. And it must be admitted that the man of science has usually bowed before the logic of this argument, and accepted the challenge : he usually advances into the field readily enough with an explanation in words of what he means by energy. The question for us is this : is the man of science right in accepting the challenge ? Here we are faced by an interesting question in practical psychology. There is another conception which is of the greatest importance in thermodynamics, the conception of “entropy.” The principle of the conservation of energy cannot be understood in its application to thermodynamics without calling on the principle of “entropy”—for as we have seen available energy

(energy available for mechanical work) is constantly diminishing, and therefore there must be something, and to this the name "entropy" is given, which increases as the available energy diminishes. Yet nobody thinks it easy, and very few think it possible, to offer a definition of "entropy"—to say in words what it *is*. There are, of course, a number of more or less intelligible things that can be said *about* it. If heat is passed from one body to another in such a way that no energy is utilized for mechanical work, *i.e.*, by a process of a simple conduction, then the total entropy of the two bodies increases in the process; that is to say, when the energy of a body which is available for mechanical work is at a minimum, then the entropy is at a maximum. Entropy is a function of the probability of state of a substance. "Entropy is a quantity such that without a change in its value no heat can enter or leave the body. The amount of this heat, however, is not measured by the change of entropy, but by that change multiplied by another quantity—the absolute temperature" (Maxwell, *ib.* p. 194). And again— "The temperature may be defined as the rate at which the energy increases with increase of entropy, the volume remaining constant" (p. 195). No doubt it is possible by assiduously rubbing together, as it were, these various statements to gather a fairly definite notion of the kind of thing that entropy is. But I think that anybody who pursues this line of inquiry until he feels he has some notion of what is meant by entropy, will agree that as far as any accurate understanding or definition of the conception is concerned, it is a hopeless task to pursue the inquiry in words. It plays its part in physics as a mathematical function, and a mathematical function it may safely be allowed to remain.

Why need we hesitate to admit that the concept of energy is in the same case? How much does it matter that these mathematical conceptions, which appear to have a definite enough

meaning in mathematics, cannot be defined in ordinary language? And why is it generally thought to matter? I think it is, as I have said, because of the old heresy that the physicist is proceeding *ἐς τὰς ἀρχάς*, "back to the simple natures": that if he performs his task properly he will provide us sooner or later with axiomatic *ἀρχαί*, from which we shall be able to proceed directly, by simply "turning the handle of the inferential machine," along the broad road *ἀπὸ τῶν ἀρχῶν*. The physicist is thus expected to provide us with a first principle so pregnant that to the man of common-sense, who will with his feet in the fender simply "work out its implications," all the difficulties in regard to physical phenomena will fade away.

This heresy may perhaps seem to be now so antiquated and dead as not to need powder and shot wasted upon it: but I think it will be found to be the real enemy. It is only on the supposition that this view is a true one that the scientist can be expected to give us a short verbal formula defining what he means by energy. Of course, the man of science as often allows himself to be misled in this regard as does the philosopher: no doubt he sometimes makes extravagant claims for the efficacy of a blessed word: and indeed the physicist is probably making claims to-day for the conception of energy which will be repudiated by the next generation of scientists. The day will no doubt come when the term "energy" will be discovered to be misleading and will be discarded; and no doubt in their hearts most physicists know this. But it is only possible to discover why the term is misleading by going on trying to make it serve as long as possible. Mach, as we have seen, foreshadowed the doom of the word—probably prematurely. We may rest satisfied, moreover, that philosophers will find themselves equally puzzled by the term which replaces "energy." It may be questioned whether we shall ever fully understand what was meant by the word "energy" until the time comes for us to understand why it shall have been rejected.

What conclusions is the philosopher to draw, then, from his discovery of this element of fluidity and indefiniteness in scientific terms? If we think, with Descartes, that science is essentially analytic in method, that is, that science gains new knowledge by discovering hitherto unobserved consequences to be "necessitated" by its first principles, then the lack of definition of first principles vitiates scientific method through and through, and we must reject science as an ingenious hoax. But this we do not think. It is surely clear to every thinking man that the development of a science is reflected in the development of the meanings of its fundamental terms: it is quite obvious that the meanings of these terms change from generation to generation, and clearly these changes do no harm or hindrance to the continuous progress of science so long as they represent a development and not a substitution.

Clearly at this stage we are called upon to attempt to give some positive account of what it is, in fact, that science is trying to do. If it is not giving an explanation of what the world really is, if its first principles do not offer the key to the actual principles of construction of the universe, then what is science talking about? If we are to make a clear distinction between physics and metaphysics, what province are we to allot to physics? This task is certainly beyond our feeble powers. But if we are to attempt it, it will be well to start with the careful consideration of a concrete instance to illustrate scientific method.

Let us take a simple case of the use of the second law of thermodynamics. As is well known, water, unlike most other fluids, expands considerably in volume when it turns into ice. In view of this fact "James Thomson found that a perpetual motion machine could be imagined, fulfilling the scientific conditions rigidly, provided that the freezing point of water did not change when the pressure was increased. As befitted one associated with the development of the laws of energy, he did not

imagine that he had found a case which upset the second law, but he argued that the freezing point must change with increase of pressure, and, moreover, must become lower the higher the pressure. Experiment proved that he was right" (Soddy, *Matter and Energy*, p. 75). This law of excluded perpetual motion is quite definite: quite definite conclusions are drawn from it. Yet how are we to state it? There are many "forms of definition" given of it: yet on analysis they all appear to be indications rather than definitions. The *meaning* of the law can only be gathered by a careful comparison of experiments and of the conclusions drawn from them. Under what conditions is perpetual motion impossible? In all "real" or "actual" processes. But what is meant by a "real" process? probably a process in which perpetual motion is impossible. Perhaps this is captious: it is difficult for a mere philosopher to tell. But in all seriousness, it seems that it is probably impossible to define the conditions which are implicitly assumed when it is said that perpetual motion is impossible. Most men of science think it a waste of time to try: though they sometimes admit that it would be a great deal of help to them if they could define them. Mach finds on historical analysis that no statement of the law is irreproachable; he quotes Poincaré as writing that "the clouds had only appeared lifted from the course of mechanics because they had, so to speak, been gathered at the very origin of that science": and he himself sums up as follows: "The whole of mechanics, thus, is based upon an idea, which, though unequivocal, is yet unwonted and not coequal with the other principles and axioms of mechanics. Every student of mechanics, at some stage of his progress, feels the uncomfortableness of this state of affairs: everyone wishes it removed: but seldom is the difficulty stated in words" (p. 152).

Clearly this principle is not mechanically demonstrable: it is a presupposition of mechanics. Why then do we believe in it

and argue from it ? Is it a mere assumption ? Or is it self-evident ? . And if we say it is self-evident, do we mean that it is self-evident in the sense in which the axioms of Euclidean geometry are self-evident ? I must say that to me it seems a silly question to ask myself of a law, " Is it self-evident ? " When one reviews these very simple principles of science to try to determine for oneself which of them are just self-evident and which are just not, so many cases appear to be marginal that one is sorely tempted to say that it is impossible really to distinguish. Yet I have always believed that such an admission would be fundamentally subversive of all philosophy.

It appears to me now that this difficulty probably arises because the question is a silly one. When I ask myself " Is this principle self-evident ? " it appears to me that what I really mean is " Is this principle such that I feel confident that any conclusions which I draw from it will be found by experiment to be true ? " And if this is what is meant, it seems a silly question to ask about the first principles of physical science, because, as we have seen, it seems to be characteristic of physical science never to be *quite* sure enough of the meaning of the law to know *quite* what conclusion to draw. The scientist seems to be more confident of the law than of his interpretation of the law, and this is probably why one is never ready definitely to say that the law is *not self-evident*.

If these considerations are sound, with every advance in a science the meaning of the first principles of the science develops. And if this is so, so far from it being true that the first principles of science are " so simple that nothing can be simpler " as Descartes thought, they grow more and more complex. In the words of Gauss : " Proper as it is that in the gradual development of a science, and even in the instruction of individuals, the easy should precede the difficult, the simple the complex, the special the general, yet the mind when once it has reached a



higher point of view, demands the contrary course, in which (*e.g.*) all statics shall simply appear as a special case of mechanics." Gauss's own principle seems to possess all the requisite generality and universality, but it certainly is not immediately intelligible, for it requires us first to think away the distinctions between space and time.

It seems then that we must abandon the view that science is proceeding *ἐς τὰς ἀρχάς*, in the sense of simple immediately apprehensible principles from which by means of simple immediately apprehensible inferences all the phenomena can be explained. It would be tempting to say that since science in its "explanation" of the universe has, as Kant showed, to take up a point of view, the complexity of the explanation will vary with the point of view adopted. It should, I think, be possible for modern mathematics by transformation to render rational the movements of the heavenly bodies on a geocentric basis, but it would not follow that the earth stands still and the heavenly bodies move round it. It seems that science tries to discover what would happen on certain suppositions—physics works on the assumption that everything is explicable in terms of motions: if it did not assume this, it would no doubt not advance. But nobody really feels convinced that if there were going on outside us just what the physicist asserts is going on outside, and nothing else, that we should see colours or feel desires. He "explains" the "phenomenon" of colour-vision in terms of moving particles: but of course he cannot prove to us that if there were nothing more than this going on we should be seeing colours—nor does he try to do so. He tells us that all that he can discover to be going on in the body which we see as coloured is certain movements of particles, and that all he can tell us about the particles as yet is so and so. The physicist looks for movements and relations between movements and he finds them: he assumes that all movements can be explained in terms of movement alone, and

gives the best account of the world that he can on this assumption : and in time his account becomes very complicated.

At this stage it will be a help to our sense of proportion to remember that other scientists look for other " phenomena " and find them. We may now fruitfully inquire whether these other sciences explain their " phenomena " in terms of first principles of their own, or whether in the end all sciences are driven back to the same first principles, back to the conception of energy. Do the sciences in fact give us one systematic account of the universe based on the one first principle of energy, or do they give us many systematic accounts, each based on different first principles ? Let us turn for the moment to biology.

In biology we seem to find at once the same demand for a continuous identity which shall persist through changes. " The naturalist brings together the organisms that are like each other, then divides the group into sub-groups within which the likeness is still greater, and so on ; all through the operation, the characters of the group appear as general themes on which each of the sub-groups performs its particular variation. Now such is just the relation we find in the animal and vegetable world between the generator and the generated ; *on the canvas which the ancestor passes on*, and which his descendants possess in common, each puts his own embroidery. True the difference between the descendant and the ancestor are slight, and it may be asked *whether the same living matter presents enough plasticity to take in turn such different forms* as those of a fish, a reptile, and a bird. But to this question observation gives a peremptory answer. It shows that up to a certain point in its development the embryo of the bird is hardly distinguishable from that of the reptile, and that the individual develops, throughout the embryonic life in general, a series of transformations comparable to those through which, according to the theory of evolution, one species passes into another : . . . Every day before our eyes the highest

forms of life are springing from a very elementary form. Experience, then, shows that the most complex has been able to issue from the most simple by way of evolution. Now, has it arisen so as a matter of fact? Paleontology, in spite of the insufficiency of its evidence, invites us to believe that it has . . . So that, all things considered, the transformist hypothesis looks more and more like a close approximation to the truth." (Bergson, *Creative Evolution*, p. 34. Italics mine.)

Now, what is it that the evolutionist theory assumes to persist through change and growth? What is that which is said to develop or evolve? At first sight it may appear that we have at work in biology, as in chemistry or physics a theory of the conservation of energy. Life, it is said, cannot result in the creation of energy; it can only make the best of a pre-existing energy which it finds at its disposal. Thus there is said to be at the root of life "an effort to engraft on to the necessity of physical forces the largest possible amount of *indetermination*." (*Ibid.*, p. 120.) Thus it was necessary to the possibility of all forms of life that there should be stored up here and there on the face of the earth reservoirs of potential energy from the sun, which should be able to be released by a very small effort. The biological distinction between animal and plant life seems to be drawn in terms of different methods of dealing with the energy available to them. "While the animal evolved, not without accidents along the way, toward a freer and freer expenditure of discontinuous energy, the plant perfected rather its system of accumulation without moving" (p. 123). And even more significantly we find in Bergson mention of a theory of genetic energy. "It is well-known that, on the theory of the continuity of the germ-plasm, maintained by Weismann, the sexual elements of the generating organism pass on their properties directly to the sexual elements of the organism engendered. In this extreme form, the theory

has seemed debatable . . . But it might be said that though the germ-plasm is not continuous, there is at least *continuity of genetic energy*, this energy being expended at certain instants, for just enough time to give the requisite impulsion to the embryonic life, and being recouped as soon as possible in new sexual elements, in which again it bides its time. Regarded from this point of view, life is like a current passing from germ to germ through the medium of a developed organism. It is as if the organism itself were only an excrescence, a bud caused to sprout by the former germ endeavouring to continue itself in a new germ. The essential thing is the continuous progress indefinitely pursued, an invisible progress, on which each visible organism rides during the short interval given it to live."

This theory of the continuity of *genetic energy* I have been unable to follow up. But while at first sight it may appear that biologists are throughout talking in terms of the conservation of energy and that this principle is fundamental to their inquiry, yet on closer examination it appears that such language only arises in certain connexions, where it is due to the real and obvious difficulty of determining the relation of processes of life to their physico-chemical bases, while in the ordinary way biologists unequivocally admit that the facts which the evolutionist hypothesis is intended to meet cannot be explained in mechanical terms—in other words, they admit that, rightly regarded, the theory of evolution is not a mechanistic hypothesis.

In principle, then, whether with Lloyd Morgan they prefer to adopt an "agnostic attitude" and simply accept the "emergence" of new forms with "filial piety," regarding it as here and now impossible to offer any theoretic explanation of that emergence, or whether with Bergson they attempt to explain the appearance of these new forms by postulating some "élan vital," at any rate it may be said that biologists generally agree that processes of life do present genuinely "new" forms which are

unpredictable on any mechanical assumptions. So far, I think, most biologists would be prepared to follow Mr. H. W. B. Joseph's analysis : " Whether we look at the growth of an individual from a fertilized egg-cell or at his evolution from some remote ancestor of a very different form, there is no material unit or collection of units that is the subject of the process. It is a mere illusion to suppose that the continuity of the germ-plasm in any way lightens the problem. For the germ-plasm which continues is no self-same physical thing . . . What continues to be is something immaterial, a form of combination maintained through change, and displayed in an aggregate of physical units which is never for two moments the same. . . . But we do, I think, commonly distinguish aggregation from growth by this, that in growth there is a unit determining the continuous manifestation of a certain form, but in aggregation not . . . Now in that growth of an individual, in which there is a change of structure as well as of scale, the form which comes to be displayed later was not displayed before ; and yet unless it is the same form, there is no growth but only substitution, such as might occur in an anagram, when one arrangement of letters replaces another " (*Concept of Evolution*, p. 14).

Clearly the concept of " evolution " and " development " imply that there is something which endures throughout, while " evolving " or " developing. " What is it then which biology assumes to be enduring throughout ? At times it appears from his writing that Mr. Joseph has finally satisfied himself that the only thing which can " evolve " or " develop " is a mind, and that on no condition will he admit that the use of the terms in biology can be other than grossly misleading. If this is his view, it is difficult to follow him. Surely the philosopher should rather hail with welcome the attempt of scientists to think of as being conserved something incompatible with the mechanistic hypothesis, however difficult it may be to say what that

something is, and to think of as manifestly evolving in time a process which is demonstrably not mechanical, impossible though it may be to describe in words the working of the process. If our argument has been sound every science is bound to assume that something is conserved: biology refuses to allow that this something is mechanical, and has tried to frame its hypothesis in words which will publish this fact. Mr. Joseph seems, at bottom, to be assuming that everything which is not mind is wholly explicable in terms of mechanism, and that anything whose change is not explicable mechanically must be a mind. Biology explicitly states that this assumption is false; it insists that living processes are neither "material nor mental," and that in point of fact in the scale of evolution they seem to mediate between the one and the other. If in his inquiry the biologist recognizes processes of this intermediary kind, the philosopher has no right to force him into the one category or the other with an apparently *a priori* "either-or." Here the biologist must be allowed to have the last word.

Whatever then may be said to be conserved in biology, it is certainly not mechanical energy. And this conclusion suffices for our argument here. Even if we insist on searching, as some do, for a fundamental concept in terms of which all the sciences may correlate their conclusions; even if we think that "to-day it is possible to link up not only physics and chemistry and geology and evolutionary biology, but also anthropology and psychology, into a whole which, though far from complete, is at least organized and coherent with itself:" we know that the concept which makes this possible is not the concept of energy. We are driven much farther back, to something far more vague and undeterminable. If we could come to such a monistic conclusion, we must believe "that there is only one fundamental substance, and that this possesses not only material properties, but also properties for which the word 'mental' is the nearest approach; we want a

new word to denote this *X*, this world stuff; 'matter' will not do, for that is a word which the physicists and chemists have moulded to suit themselves." (J. S. Huxley, *Essays of a Biologist*, p. 243.) The right word and the meaning of the word are still to seek.

What then are we to say of the principle of the conservation of energy? Are we simply to say that it is a conception useful to those who have determined to explain the world in terms of motion, while in the sciences of those who are determined to explain the world from some different standpoint it plays no essential part? If we say this we seem to be representing the sciences as a kind of jig-saw puzzle. But even so, is this attitude wrong in principle? If we take a map and fill out with a number of fanciful details our theory that Italy is a man's leg and foot in the act of kicking Sicily we may, provided that we play the rules of the game, learn a great deal about the contouration of the countries of Italy and Sicily; no doubt we shall not learn everything, but we shall learn something.

But clearly science involves more than a mere game of this sort. Science has this in common with the game that it proceeds by trying to represent the world as something which it does not really believe it to be—but there are some ways in which no thinking man would try to represent the world. This seems to be the importance of a deduction of the categories, that it tries to determine the various ways in which the mind may set out to represent the world to itself as a system. But if Kant is right, the number and the nature of the fruitful ways of inquiry are relative not to the nature of reality but to the nature of the mind. The evidence that a new fruitful method of inquiry has been found is the fact that a science is able to argue and demonstrate on a minimum of assumptions and definitions; and no doubt it is difficult in the early stages to tell whether the new way will be fruitful or not.

It would seem then that metaphysics must detach itself from the sciences one and all, and ask itself what is this world whose processes various scientists "explain" so variously. And further, as Kant points out, the philosopher must not accept the statement of any one science uncritically. He must say to himself *e.g.*, "When I see a colour, the only motions which the physicist can assert to be going on are so-and-so, but of course it does not follow that colour-vision can be wholly explained in terms of motions of particles; or again, when I am thinking, because the only physical changes which can be asserted to be going on are such and such, it does not follow that this is the whole fact to which I refer, when I say I am thinking."

It seems then that we must regard physics as setting out to discover a hypothesis which shall cover the observed facts on the assumption that all visible changes are conditioned by changes of motion of parts. If this is so, a certain indefiniteness in the conception of energy, amounting at times, if you like, to a confusion, simply indicates (what we have known all along) that physics has not yet completely accomplished its self-allotted task. If physics claimed that it started with the *knowledge* that energy is conserved, and admitted that had it not *known* this first it could never have come to know anything else—if it admitted, in fact, that all so-called advances in physics were really derived by analysing the *known* principle of the conservation of energy—then, indeed, it might fairly be claimed of physics that it should be able to define energy without contradiction, and if it failed it might reasonably be repudiated as an impostor. But since in these days nobody thinks that physics proceeds in this way, it is difficult to see why we imagine that we can claim such a definition. The truth is that if the physicist could tell us what he means by energy he would be telling us all he knew, and even then there would be detectable incoherences—and yet we expect him to tell us in a short sentence.



All we can do for the concept of energy then is to give some account of it at work—no more and no less than we could do for entropy. We may leave the task of defining it to the lexicographer—and he will probably define it in its technical sense as “that which physics assumes to be conserved.”

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## II.—By DOROTHY WRINCH.

The Principle of the Conservation of Energy in its present-day form has been stated by Max Born in *Einstein's Theory of Relativity* (p. 45). The Principle states that for closed systems, total energy made up of

*the kinetic energy + the potential energy + the acoustic energy*  
*+ the heat energy + the chemical energy*  
*+ the electromagnetic energy. . . . .*

remains constant.

When we state the Principle in this comprehensive form we are indeed grouping together in one statement a multitude of separate statements which are applicable to systems of various kinds. Thus, to take a simple example, if the system under consideration is such that no phenomena occur in which mechanical energy—consisting of kinetic energy together with potential energy—is transformed into heat, sound, electro-magnetic effects, chemical affinity and so on, then we have the simple historically important form of it.

*Kinetic energy + potential energy = mechanical energy*  
*= constant.*

In this form the Principle contains within itself large tracts of the dynamics of systems where there are no frictional forces. An example of this form of the Principle has been provided by Mr. Morris's paper: in a slightly different form we may take the case of two masses at each end of an inextensible string which is hanging over a smooth pulley in vacuo. Then, if the masses are given any initial motion and the system is left to itself, for ever afterwards the kinetic energies and the potential energies of the two masses together add up to a constant sum, which is equal to the

initial value of the mechanical energy of the system. In particular if the masses are equal, so that there is equilibrium when the string is hung over the pulley, the various positions of the two masses, when, *e.g.*, they are both at the same depth below the pulley, when one is twice as far below the pulley as the other, and so on, give a different distribution of potential energy between the two bodies, but always the same total potential energy, the kinetic energy in the various cases being unchanged.

Consider, next, a system in which there is transformation of mechanical energy into heat. Then the form of the Principle states that the total energy still remains constant, and the change in the heat energy balances the change in mechanical energy. In this form the Principle covers large tracts of thermodynamics.

We could take other examples of systems where the electromagnetic energy is varying, as, for example, the case of molecules emitting radiation of various wave lengths. But, owing to the wonderful conception of the total energy of a system as being made up of all these apparently different forms of energy, the general laws which at present hold the field in physics and chemistry can all be collected into the one single comprehensive principle.

#### THE PRINCIPLE AND THE THEORY OF RELATIVITY.

During the last few years the Principle of Conservation of Energy has undergone a certain amount of modification under the influence of the new ideas of the Theory of Relativity. We may discuss this modification most simply with reference to systems in which the kinetic and potential energies are alone varying.

In its original form for such a system

$$\text{kinetic energy} + \text{potential energy} = \text{constant},$$

the Principle was an immediate deduction from the Newtonian Law of Motion

$$\text{rate of change of momentum} = \text{impressed force}.$$

With the coming of the Theory of Relativity, the momentum of a body—which was before taken as the product of the mass and the velocity of the body—was redefined. In its new form we have

$$\text{momentum} = \text{velocity} \times \text{mass},$$

but the mass involved in this equation is no longer a specific constant associated with a body, independent of the motion of the body, as in the Newtonian Mechanics, but the new variable mass  $m$  which depends on the velocity. In consequence the kinetic energy takes a new form. It is no longer " $\frac{1}{2}mv^2$ " as in Newtonian Mechanics, but

$$m_0c^2 \left\{ 1 / \left( 1 - \frac{v^2}{c^2} \right)^{\frac{1}{2}} - 1 \right\} \dots\dots\dots (1)$$

where  $m_0$  is the mass associated with zero velocity and  $c$  is the velocity of light. This expression for  $T$  the kinetic energy may also be written in the form

$$T = mc^2 - m_0c^2 \dots\dots\dots (2)$$

so that it is proportional to the excess of the mass when there is velocity  $v$  over the mass when there is no velocity. This is a result of the greatest importance in the structure of science.

When  $\frac{v}{c}$  is small, so that powers of  $\frac{v}{c}$  above the second are neglected, we get the Newtonian form

$$T = \frac{1}{2}m_0v^2 \dots\dots\dots (3)$$

and it can be shown that this definition of kinetic energy is rigorously valid even if the terms of higher order than the second are not neglected. With this new form for  $T$ , it is a logical deduction from the premisses of the Theory of Relativity that in closed systems in which there is no transformation of mechanical energy into the other forms of energy, mechanical energy consisting of kinetic energy (defined as in (1)) and potential energy is conserved.

This important new conception that  $T$  is given by (2) may also be put in the form

$$m = m_0 + T/c^2$$

—so that mass differs from its value at rest by the kinetic energy divided by the square of the velocity of light. This result suggests that  $m_0$  the statical mass is related in the same way to the energy content of the resting body (see Born, *loc. cit.*, p. 232), for then there would be the universal relationship

$$m = E/c^2$$

between the mass and energy whatever the motion of the body. This has in fact been proved to be the case by Einstein, who has called the result the *Law of Inertia of Energy*.

This law should be studied in connexion with the theory of the Conservation of Mass, which in classical mechanics was an equally important but logically independent member with the Conservation of Energy in a dual partnership. Now, with a stroke of the pen, Einstein has reduced the Principle of the Conservation of Mass *in its generality* to pulp, and has shown that mass is itself only a manifestation of the evidence of a corresponding amount of energy. Indeed, we can go so far as to say that it is only a question of units, which idea we use. For a unit increase of mass is equivalent to an increase of  $c^2$  units of energy, in the current system of units.

Now we have been discussing a system in which there is no variation in the non-mechanical kinds of energy. In such a system the Conservation of Energy and of Mass are different ways of expressing the same fact. But suppose that an amount  $A$  of the mechanical energy escapes as radiation, then the mass associated with the system decreases by an amount  $A/c^2$ . Conversely, the destruction of mass  $m$  sets free an amount of energy  $mc^2$ . The Conservation of Mass is now but a poor phantom. Systems exist in which mechanical energy changes into radiation. In such systems the mass has to comply and decrease in accordance with the amount of mechanical energy lost. In his theory

that the energy of stellar radiation is produced by a secular decrease in the star's mass, J. H. Jeans has made use of this possibility, and on this theory, to take a specific numerical result, the radiation of the sun can only be kept up if the sun is losing mass at the rate of about four million tons per second ; and a giant star of absolute magnitude  $-5$  must be decreasing in mass at ten thousand times this rate.\* This single instance shows the enormous importance of the view taken of the Conservation of Energy, for the origin of the energy contained in stellar radiation has been a most baffling problem.

This new position of the Conservation of Mass indeed throws important new light on the structure of the universe. At first the Conservation of Energy was considered applicable only to systems where kinetic and potential energy alone were varying—and in such systems the Conservation of Mass was also asserted. With the epoch-making discovery by Joule of the mechanical equivalent of heat, the way was cleared for the extension of the principle of the Conservation of Energy to a system with variable amounts of kinetic and potential energy, and heat energy in addition. And it was only a matter of time for the general extension to be made to all kinds of energy. The case of the Conservation of Mass was quite different. When mechanical energy escapes into radiation mass decreases. Mass, indeed, is a concept only useful in systems where the mechanical energy remains constant. It can in such cases be expressed in terms of the mechanical energy merely by a change of units. In other cases the Conservation of Mass collapses. Mass is, in fact, only useful as a concept in the very restricted domain of systems of the specifically mechanical type, and in this domain is merely a multiple of the mechanical energy. Its downfall as a fundamental idea is thus complete.

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\* "Monthly Notices of the Royal Astronomical Society," November, 1924.

The position is analogous to that of a conquering nation which allows a native king to continue to exist provided that he pronounces the views of the conqueror, though in different words, but does not allow the native king to utter a single word outside his restricted territory. Such a state of affairs is considered sometimes to be a sign of progress in the civilization of the world. We may leave aside the question of whether or not this is a true view, but in the world of scientific concepts it is indubitably a sign of progress. The conquering concept sweeps aside other concepts which formerly held equal sway with itself. The structure of science becomes increasingly satisfactory as the number of concepts is reduced.

#### THE CONSERVATION OF ENERGY IN RELATION TO SCIENTIFIC METHODS.

It is, unfortunately, not possible in the space at our disposal to give other illustrations to show the pre-eminent importance of the Principle of the Conservation of Energy. But a few remarks on the status of the Principle in Scientific Method are called for by the paper of Mr. Morris.

To begin with, we must acknowledge quite freely and without embarrassment that science is, in fact, a kind of jig-saw puzzle. The illustration of the map of Italy and a man's leg and foot in the act of kicking Sicily hits the point exactly—in a certain sense. For science builds up its theories on certain assumptions. Given the assumptions, their logical consequences are worked out. If these consequences can be verified, then a certain plausibility is lent to the assumptions. If the theory represents the state of affairs satisfactorily in some respects, then it is worthy of consideration. It will only be abandoned when some specific logically derived consequence is found to be contradicted by experiment or observation. It will be set on one side in favour of another

theory if the other theory explains and collates a more comprehensive collection of facts derived from experiment and observation.

If, however, we criticize any particular theory or concept in itself—that is to say, if we disapprove of some theory or concept, but not on account of a failure to agree with the facts of the external world—then no scientist living can dispose of us on *logical* grounds. We have, let us say, a self-consistent system which does not conflict with experience. It depends on certain assumptions. Sometimes we have different self-consistent systems, both of which agree very well with different pieces of experience. They depend on assumptions. We can go no further. We can push back the assumptions a little further and replace, for example, the laws of Newton by the sweeping abstract postulates of relativity. But behind the assumptions we cannot ever penetrate. If some seeming postulate is criticized and is thought to be obvious or plausible, we are in fact deducing it from some other postulate, so that it is not itself really the fundamental assumption.

And it is in this connexion that Mr. Morris's interesting discussion of the "back to the simple natures" heresy is relevant. Classical mechanics depended on the assumption of the Laws of Motion. Relativity Mechanics depends on Invariance Postulates. There is all the difference in the world between the tone of these postulates. The Invariance Postulates are colourless and abstract and skeletal in character. It is difficult to deny them with any enthusiasm. They are themselves so *structural* in nature that the hot enthusiasms and violent preferences for one view rather than another which are sometimes to be seen in politics, feminism, art, literature, motoring, dress, education, seem out of place. Who can get warm about a four-dimensional space rather than a ten-dimensional space? If science requires the one when the consequences of the assumption are



compared with facts of observation and experiment, we are content to assume it until it is contradicted by experience.

It is not that the postulates are uninteresting or dull, or unworthy of attention from a mathematical or scientific point of view. The most entrancing worlds can no doubt be constructed from the assumption of fifteen dimensions. But the cold dignity of the postulates makes us judge them not in themselves but only in their consequences. If their consequences fit the facts we take them; if they do not, we reject them; and, if one assumption in its consequences fits the facts better than another, we prefer it and retain the other assumption, possibly for further service later on.

Thus it is not a progress to the "simple natures" that is going on. It is rather a progress to more austere postulates which is a characteristic of modern science. The modern concepts of Relativity, in their icy dignity, allow the deduction of physics, not in a simpler fashion but in a more logical fashion. It is the aim of science to provide postulates, which by the application of logic alone, give the whole of observed phenomena.

But, at the end of all discussions, however enthusiastic, the grim fact emerges. Science depends on assumptions which we must accept or reject without logical reasons. And the Conservation of Energy, being a part of the structure of science, must be treated in the same way. We can deduce it from other postulates. But how far these are to be accepted only the successful fitting together of the facts of experience and its logical consequences can decide. The stupendous successes of the Principle of the Conservation of Energy are almost sufficient to go to the head of the theorizer on science, for they have been very remarkable.

But we must hold fast to our general methodological principles. All is grounded on assumptions for which no logical reasons can possibly be given. We have no reply to the professional sceptic. No scientist ever has had a reply and no philosopher either.

But having made this frank confession of the state of affairs in science, we should be inclined to pass on to point out that philosophical doctrines are all in the same strange, embarrassing position as scientific doctrines. For philosophers and scientists must stand together. There is nothing to decide between them in this respect. Scientists and philosophers alike stand forever on sand.

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## III.

THIRD SESSION : *July 25th at 2.30 p.m.*

*Chairman* : DR. J. S. HALDANE.

THE BIOLOGICAL BASIS OF THE SENSE OF TIME.

*By* IVY MACKENZIE.

THE records of philosophy and of science show that the concepts symbolized in the terms "time" and "space" have been the occasion for prolonged speculation and disputation. In the theory of knowledge, in the theory of mechanics, in astronomical observations, and, more recently, in the theory of memory and of evolutionary biology, ideas of time and of space constitute the framework on which the main evidence and arguments are displayed. It is not too much to say that a great deal of confusion has arisen from the fact that the hypothetical conceptions of time and space have differed considerably according to the nature of the inquiry pursued and that, while one particular conception might be quite useful in a certain line of investigation, it might be altogether inadequate in another branch of research. As a consequence it is found that the problem of "time" and "space," as such, has been rendered difficult by the custom of approaching it from the point of view of highly complicated representations of the phenomena or order of events to which these terms have reference. Practically no account has been taken of the help which is afforded by the historical method of analysing the complex process through which we have proceeded from one stage in our phylogenetic progress to another, and have thereby come to have ideas of time and space through

a gradual extension of activity and experience. The difficulty has been aggravated by the assumption, so frequently made, that the terms themselves represent something quite simple: that time is something homogeneous in which events occur, and that space is something homogeneous in which bodies move or are placed. So far from this being the case, the time in which we space our experiences or calculate the order of events is the outcome of processes of mental abstraction representing the highest activities of the human faculty. Through familiarity we take for granted, or pass over, the complicated conditions which underlie "time." So, also, is it with regard to space. We take it for granted, because we are accustomed to move freely and to explore our surroundings with our hands and eyes, and it never occurs to us that the space which we know, and which is geometrically related to the objects which we touch and see is, in thought, a highly complicated abstraction of prolonged phylogenetic experience.

There can be little doubt but that our completed representations of time and space have their origin in processes of which counting is an abstraction; that is to say, the origin of these representations is to be found in the recognition of objects which were similar and simultaneous on the one hand, and which, on the other hand, could be combined or abstracted into a single whole by successive enumeration. Thus, in the case of the five fingers, they could be recognized as similar in space and counted as five in time. Such simple processes, in all probability, constitute the basis of measurement on which the orderly regulation of experience and scientific abstraction of thought depend.

But the discovery of counting, while initiating the most important epoch in animal evolution, depended upon attainments which had already reached a high degree of perfection in animal behaviour. The elements in behaviour from which original counting was an abstraction comprised the reactions which were

essential to the animal world in its adaptation to environment. Counting pre-supposes a certain activity of thought involving the recognition of spatial and temporal relations, but the *doing* of space and of time over long ages was the condition antecedent to the abstractions of thought in measurement which gave primitive man an advantage in the struggle for existence.

There must always be something arbitrary, or even contradictory, about speculation as to the origin of life and of that manifestation of life which is termed consciousness. We imagine that life must have begun somehow, at some time and in some place ; but it can have begun only in conditions in which it was implicit. The same holds good with regard to consciousness or awareness, which must be inherent in the nature of things, although it exists, as we know it, only in a form of experience peculiar to the human faculty. It has been argued with some plausibility that where there is life there must be consciousness, that both in plant and simple animal life there must be the rudiments of primitive manifestations of that which afterwards constitutes "awareness" in the human mind. On the other hand, there are those who, with a greater show of reason, would confine consciousness to the animal world, and in so doing would relate its origin and development to the appearance and evolution of organic motility, associated with sensori-motor reactions, and commencing even in those humble forms of animal life where such reactions are not yet subserved by a nervous system.

The main obstacle to the acceptance of either of these propositions is that they imply the possibility of attributing consciousness to inorganic as well as to organic nature. There is no definite reason for believing that organic and inorganic nature are two absolutely distinct and unrelated forms of existence. The history of physiology is very largely the history of attempts to explain the organic in terms of inorganic reactions, but, as Haldane suggests, it may quite well be that inorganic reactions

may be ultimately explicable only from the point of view of organic phenomena.

The metaphysical difficulties which naturally arise in such problems may be minimized in this particular instance by adopting a definite biological point of view. It is consequently assumed that ideas or feelings of space and time have their origin in a long history of animal life in which the co-ordinate doing of space and time were indispensable conditions. Such doing of space and time is to be regarded as the condition of a special kind of movement, movement that may be characterized as organismal locomotion, and distinguishable from movements in plants, movements associated with inorganic terrestrial changes, or movements in celestial mechanics.

Having thus narrowed down the outlook, the question now arises in what manner and at which stage in animal evolution the doing of time and space is supplemented by correlated feelings and ideas. Movement from one place to another is of the very essence of animal behaviour in all its forms, but it seems reasonable to suppose that it was only at an advanced period that that movement became associated with and influenced by those conditions which we include in the term "awareness."

Let us consider shortly some of the conditions implied in the various stages through which animals have slowly evolved in the course of attaining a wider field of movement and more elaborate mode of action. There are certain features which are common to all animal organisms independently of the place they may occupy in the phylogenetic series:—(1) Each organism retains, in virtue of a system of internal regulation, a uniformity of structure and function which, for the stage of its growth, is characteristic for the species; (2) this independence is consistent with the most intimate relations of a mutual character with its environment; (3) the preservation of its identity and environmental relations are consistent with a characteristic process

of growth over an average period of existence, and with the reproduction of organisms of its own kind, with corresponding features and a corresponding life history.

Each organism thus has, at any particular moment, a place in its own immediate environment, a place in the history of its own development and in the preservation of the species to which it belongs, as well as a place in the great phylogenetic tree of animal life of which it constitutes a living unit.

The simplest unicellular organism retains its individual features while preserving an intimate relationship with the fluid medium from which it draws its sustenance. The envelope by which it is surrounded is the only place of contact with the outside world. It is the region on which stimuli impinge and through which nutritive substances enter and the by-products of metabolism leave the organism. Here appropriate selection takes place in accordance with the requirements of the individual, and the response in the form of self-preservation, movement and reproduction are dictated by a system of internal regulation. It is, of course, obvious that the characteristic features of identity and behaviour can be preserved only if the properties of the medium be within average limits. Recent research has shown how highly refined and how extremely complicated are the processes which determine the behaviour of these apparently simple masses of protoplasm which live and move and have their being in immediate contact with environment.

An outstanding feature of animal life from the phylogenetic point of view is the tendency, through differentiation, to seek a wider range of activity, and so to increase the opportunities of finding food and of escaping danger. Sensori-motor reaction becomes more complicated; a greater variety of stimuli are selected by special sense organs which supplement the tactual functions of the skin or cuticle, and on the motor side there is a corresponding elaboration of the apparatus which provides for

movement from place to place. However specialized the sensory system becomes, it preserves, just as does the cuticle of the simplest animal, an immediate relationship between the organism and its environment, and the movement which its excitation evokes is an adaptive response to the character and origin of the stimulus. The visual apparatus brings the organism into touch with objects at a distance and the expansion of the horizon from which stimuli may originate is a measure of the distance which may be traversed for food or for safety. The eyes, the ears, and the nose provide, in the case of higher animals, an incentive and guide for an increasing variety of movements and behaviour over a wide area of environment, while the skin and its specialized appendages afford the means of selecting appropriate stimuli from immediate surroundings.

Optic stimuli are also concerned in the co-ordinate adjustment of movements of different parts of the body which combine in orderly locomotion. In these adaptive reactions within the body itself there participate, also, stimuli from the otic labyrinth and from the skin, joints and muscles.

There are thus two aspects to the movements which are characteristic for animal activity; there is that aspect which is related to the external world and influenced by the state of the world through the organs of external sense; and there is the other aspect which is more immediately related to conditions in the organism itself and to stimulation by movement of special sensory terminals in the internal ear, in the skin, muscles and joints. It should be noted, however, that optic stimuli are a common factor to each of those aspects, and that the distance-receptors of vision preserve an intimacy between the remote objects of the external world and the organism and, at the same time, play a part, along with the otic labyrinth, etc., in determining the co-ordination of motor response to distant stimulation.



There is, however, a third aspect to co-ordinate movement which cannot be left out of account. The motor reaction to a stimulus cannot be explained simply on the conditions present at the time of movement or, at any rate, the conditions are in no way comparable with those in an artificial mechanism. The conditions of movement, so far from being mechanical, are always in a process of "becoming." They are, at any particular moment, the expression of conditions which have been operative, not only throughout the previous existence of the particular animal, but throughout the whole series of phylogenetic processes in the direct line of succession from the stage of its most primitive ancestor. Effacement and accession of structure and function may have produced modification of movement or reaction in particular stages of the phylogenetic succession, but the potentialities for activity at any given moment in the life of an animal depend on the balance to account that has been preserved through time by organic memory. Experience in duration has been duly registered on the organic scroll of its own life and on that of its ancestors, and reactions in terms of that experience may be represented at any moment in the course of its activities.

Let us now consider the significance of these observations regarding our contention that the *doing* of space and time is a process in animal life antecedent to and conditional for those forms of experience in which ideas and feelings of space and time play a part. The preservation of certain temporal and spatial relations is a condition necessary for the normal movements of all animals, including man. Adaptive spatial and temporal relations are manifested in the two main categories of movement,—(1) in the movements which, in combination, give the body its characteristic motility, and (2) in the movements which secure an orderly adjustment to environment. Sherrington has pointed out in his work on the Integrative Action of the Nervous System how co-ordinate motor response depends on the

selection of reflexes which, in their spatial and temporal relations, combine to produce an orderly sequence of events; and this orderly sequence of events applies, not only to the grouping of muscles in relation to each other, but also to the ultimate effect in the natural response of the organism as a whole to environmental stimuli.

Now all animal movement may be traced ultimately to the rhythmic contractions of the primitive unicellular organism. Its displacement by contraction is the first *doing* of space, and the "refractory period" which regulates the rhythmic change is the first *doing* of time. Sentient nature begins with a sense of the world limited to impressions received by a simple cuticle from the adequate stimuli in the fluid by which it is immediately surrounded. While it preserves its identity and transmits its features, the protozoal unit maintains an intimate connexion with the rest of nature in terms of limited mutual exchange. In some mysterious way it conserves in its duration the experiences of the past and harbours the potentialities of the future. It should be noted that while the *doing* of environmental space involves a subservience to temporal conditions, the *doing* of time is only partly reflected in locomotion. Stimuli selected by receptive adaptation may be conserved for the time being and released only on the subsequent occurrence of appropriate stimulation, although, of course, the conditions for release may never materialize. The organism in its process of "becoming" is at any particular moment at a point of conflux between a past which it has conserved, both individually and phylogenetically, and a future which will be realized both in an individual and in a phylogenetic sense. In this provision for the future in terms of the past there is something which disengages the organism from the ligation of the present. An everyday example of the same process on a limited scale is seen in the growth of the pregnant uterus whose gradually increasing muscular tissue

performs its contractile function only after a considerable period and when the conditions which determine its contractile reaction come into play. Underlying these concatenations of events, in which a distinction between past and future is merely arbitrary, is the process of duration or of organic time, a process which can be most adequately conceived as an expression of design.

During the ascent of the evolutionary scale the interaction of the organism with its environment becomes more extensive without losing any of its intimacy. Tactual stimuli continue to play an important part in provoking reaction, but stimuli from a distance become an increasingly important factor in determining movement to a distance. The *doing* of space and of time becomes more complicated. The variety of adequate stimuli from environment increases with a greater differentiation of receptor organs and surfaces. A corresponding differentiation and refinement of the locomotor apparatus ensures a wider range of movement and a more rapid articulation in reaction. The ever-changing scene of surrounding nature becomes more fully represented on the sensory side of the organism, so that the struggle for existence on the motor side is pursued with greater chances of success. A more varied and more intimate experience of the world is gradually incorporated in the life of the organism in the process of duration.

We have no means of knowing how a dog looks at the world. To deny it intelligence, or even understanding, would be tantamount to a confession that one had never lived with dogs. In respect of intelligence one dog differs from another, and one breed may surpass another. Capacity for training in tricks is not so remarkable as the exquisite adaptation to the environment for which a particular breed may be specially suited. A wide range of vision, a keen sense of smell, and ability to interpret the meaning of simple sounds, bring within the ambit of its experience a world of multiple interests. Diversity of emotional

reaction, submission to discipline, and inhibition of impulse are features of behaviour which, while developed by domestic association, suggest an inherent relation to human conduct.

But in spite of all this we cannot conceive what the world looks like to the dog. That there is some form of consciousness, there can be no doubt. There is evidence of memory and of anticipation, of that sense of continuity in the succession of events which is suggestive of the feeling of time. But, after all, it moves in a small world in which its behaviour is largely pre-determined by a hereditary capacity for doing time and for doing space. We are apt to exaggerate its performances because we are surprised at the efficiency of its automatic responses. There has accrued to it from a long ancestry in the animal scale a legacy of temporo-spatial potentialities which, when realized, enable it to behave with characteristic perfection in a small world of its own. That world is represented in and constructed out of a small brain. It is a brain with few problems in the human sense. The struggle for existence is pursued on the whole after a manner dictated by the impulse of the grosser emotions, and the fable of the bone mirrored in the water affords a measure of canine capacity for indeterminate conduct.

Of the innumerable streams of thought originating in the Darwinian hypothesis, one of the most popular has been the speculation as to the relation of man to the rest of sentient nature. The theological prepossessions of the earlier period of modern philosophy assigned to man a special sphere in the scheme of things. The features which distinguished him from his progenitors in the animal scale were emphasized in such a way as to suggest that he had an independent and special origin in creation. The reaction to this attitude is seen in a swing of the pendulum to the opposite extreme where the features which man exhibits in common with the rest of the animal world have been portrayed in such a way as practically to leave out of account

the distinguishing characteristics which give him his predominant position.

It is quite obvious that among his original endowments man possesses in an exquisite degree the capacity for doing space and time. His articulate movements in space are more intricate and more variedly adaptive than those of any of his phylogenetic antecedents or contemporaries in the animal world. If he has not the vision of the eagle or the olfactory sense of the dog, the products of his sensations are combined in such a way as to bring him into a more comprehensive relationship with the rest of nature, and so contribute to the foundation of a knowledge on which depends the conquest of himself and of his environment.

Among all the members of the animal kingdom he has inherited the largest legacy from the past. "Cephalization" is the term employed by Gaskell to designate the gradual concentration in the brain of the neural phenomena which exercise a determining influence on the sensory and motor reactions of the organism as a whole. No animal is to be compared with man in the extent to which, through organic time, the experience of the past is represented in the present. He is not the only animal with a neopallium, but if the degree of expansion of the neopallium be, as there is reason to believe it is, an index of organic superiority, then he is incomparably the highest product of animal creation. He retains the capacity for doing time and for doing space possessed by his phylogenetic ancestry and, in addition, he has shown in his history the evidence of an ability to rise to higher levels in which ideas and feelings of time and space play a leading rôle.

It has been suggested already that a critical stage in animal evolution was reached when the discovery of numbers or of counting was made. The discovery could have been made only if there already existed a certain degree of refinement in the temporal and spatial relations between the organism and environ-

ment. It pre-supposes, also, an externalization of the outside world as a result of experience, and such externalization carries with it the implication of a certain degree of subjective independence on the part of the organism. It might be helpful to consider how this has come about.

However organic life, as we know it, may have come into existence, it is accepted that once the organism has been established as a living being it is subject to a system of internal regulation through which are preserved its identity and characteristic behaviour. Its contact with the external world is, to begin with, strictly limited. As it rises in the animal scale it moves further and reacts to stimuli at a greater distance; in other words it extends its communion with the outside world by means of organic penetration of both a sensory and motor character. Its special sensory organs and nervous system are so arranged as to give it a definitely geometric attitude to its surroundings, an attitude which is only modified in the rhythm of locomotion. In the higher branches of the vertebrate phylum stereoscopic vision, neruo-muscular arrangements for conjugate deviation of the eyes, and correlated movements of the head on the trunk, together with bilateral organs of equilibration adjusted to three dimensions, all in an organism of bilateral symmetry, combine to give the animal a position and posture geometrically related to the world which it explores through its senses and apparatus for movement.

But man has isolated himself and externalized the world more completely than any of his progenitors. He has done so after a manner peculiar to his own experience and behaviour. Counting or the invention of numbers is only one of the conditions incident to the development of the human microcosm within the macrocosm. The assumption of the erect posture freed the fore-limbs from locomotion, and the hands became instruments for refined sensory discrimination and, in conjunction

with the eyes, facilitated a more elaborate inspection of environment and a more extensive and refined manipulation of its contents. The manufacture of tools was the natural sequence, and in this way was introduced a medium calculated to supplement and extend the means of sustenance and protection. Evolution of the face and larynx prepared the way for the differentiation of a mechanism of speech, and primitive chatter in the comparison of experiences was, no doubt, of use in crystallizing notions about the world and the methods of combating dangers which it harboured.

At this stage primitive man, in virtue of his inherited capacity for doing space and time, and organically so constructed as to do space in a geometrical fashion, is, by reason of his capacity to count, to use his hands, and to engage in conversation, capable of creating, by a process of abstraction and conscious attention, a world of his own. This world is, no doubt, to commence with, quite insignificant; its character and extent are proportionate to his capacity to create.

In the records of the earliest civilizations there is evidence that this creative power had already reached an advanced stage. Counting had developed into systems of measurement by which fields were laid out, irrigation planned and houses constructed and arranged in order. Thought, which had become symbolized in vocal expression, found further symbolic expression in marks on stone and tablets. Expressions of the social instinct were regularized in the light of these attainments, and the events of human experience were marked off on an astronomical scale of time, based on a recognition of the regularity of movement of heavenly bodies across the sky.

Apprehension and curiosity are general terms which suggest the feelings aroused through interaction with the outside world. They are allied to the feelings of hunger and thirst which are associated with the instincts to eat and drink, but they are more

intimately related to that product of the creative imagination realized in the more or less orderly views which man had of his surroundings in the early stages of civilization. Disease and death, the perils of the chase and conflict with enemies, thunder and lightning and meteors, were among the incidents which demanded an explanation, and the response to this demand is to be found partly, at least, in the theory and practice of astrology. Out of astrology grew astronomy with its still more insistent demand for a rational explanation of the universe, and involving on the surface, at any rate, a more complete isolation of man on the one side from the extended world of his creative experience on the other. The cosmogonies of ancient civilization and the modern astronomical conceptions of the universe represent phases through which the human mind has passed in its attempts to create an adjustment between current thought and the data of observation in one particular field. The evolution or variation of cosmological theory shows how such theory must fall in with the general prepossessions of the period in which it prevails. Ancient cosmogony was rendered obsolete by the system of Ptolemy, while the discoveries of Copernicus, Galileo, Newton and Einstein, involved successive cataclysms in thought, each of which was followed by a new orientation to the physical world of reality. While it prevailed, each of these conceptions was accepted as an absolutely reliable representation of celestial phenomena, constructed by the exact measurement of motion in terms of time and space, the product of geometry and mathematics, the only true sciences. Time and space were regarded as absolute; to regard them as such was necessary for the purposes of the construction. No regard was paid to the fact that the conception of absolute time and space was itself an abstract notion derived, in the first instance, from the simpler expedients of measuring by arbitrary standards at a period when the creative faculties of primitive man began to assert themselves. The



concept of absolute time is derived, moreover, from the concept of space because we have no means of measuring abstract time except those in which it can be expressed in terms of spatial relations.

The characteristic feature of modern philosophy is that it has raised the blunt question as to the validity of what we know. Doubt is the inspiring emotion of the Cartesian teaching, and while Descartes himself propounded theories which offered an explanation of inanimate and animate nature on a mechanical basis, the underlying principle of his philosophy is summed up in his "*cogito ergo sum*." In this famous formula he indicated what he conceived to be the fundamental starting-point for those whose business it is in life to search after truth. He recognized that the path of knowledge was strewn with delusions and that it was a sacred duty to proceed in the spirit of doubt. Authority might be mistaken, the senses might deceive, and the understanding might mislead; but there was one incontrovertible fact, namely, that consciousness exists. Here, at any rate, was something that was real; thoughts might be elusive but as to the reality of their existence there could be no doubt. The subjective attributes of any object of thought are the elements of its reality. We bring to the interpretation of the external world those contents of our consciousness which give the world the qualities by which it is recognized. We are enabled to react normally to environment in so far as that environment is invested with the normal forms of our consciousness.

The Cartesian philosophy reflected thought at every point of contact with the problems of life. There was no great problem, from celestial mechanics to the human soul, which did not come within the ambit of its influence. This is not the place in which to suggest a point of view from which the apparent contradictions between its mechanistic and idealistic aspects may be reconciled. It absorbed and reproduced in an original form the spirit of the

age and stands in relation to the two main currents of European thought which it inspired. One stream may be taken as represented in the reflections of Berkeley and Hume, the other in the immortal discoveries of Newton. Of primary importance for Berkeley was the nature of the process involved in the acquiring of knowledge. To him, what is regarded as external reality can have no conceivable existence beyond the circle of consciousness. He rejected the external reality of space and recognized it as being exclusively the subjective product of sensations of sight, touch and movement. Newton, on the other hand, accepted as a hypothesis the reality of the external world and proceeded by experiment and by the application of mathematical and geometrical principles to formulate a rational conception of mechanics and of a mechanical universe. For Berkeley time, space and motion are relative and referable only to subjective experience, for Newton time and space are, of necessity, absolute.

The contrast between these views may be exemplified by reference to what has been said already in regard to the phylogenetic origin of time and space. To the unicellular organism the external world of reality is in immediate relation to the cuticle by which it is surrounded. As the sensori-motor system becomes more highly differentiated the external world is gradually projected to a distance, relative in one aspect, at least, to the capacity for vision. Man arrives on the scene of a territory already largely explored by the adaptive reactions of his phylogenetic ancestors in their temporal and spatial relations to environment. He adds to his adaptive capacity which has a certain geometrical basis, by creating tools and numbers and symbols of thought. These inventions give economy and precision to his mode of behaviour, and he is enabled to form notions of the way in which his actions are related to environment. His instruments or constructions are utilized for projecting to a greater distance his sphere of interest and influence, and ultimately

by the aid of telescopes and spectroscopes he brings himself into contact with a universe far beyond the range of the naked eye. This is the universe which interests Newton ; but he accepts it as a problem for the extension of knowledge without asking how the mighty macrocosm has come to be related to the limited consciousness of man. He applies the abstractions and symbols of geometry and mathematics to movements in terms of time and space without considering the relation of these to subjective experience. For him the external world of vision exists by its own right, and over against it he stands deciphering by his masterful genius the laws which govern its existence. Berkeley, on the other hand, questions the validity of the hypothesis of independent externality related to absolute time and absolute space. "Absolute space," he says, "is infinite, immobile, indivisible, not perceivable by the senses, unrelated to anything, without distinction between its parts. Thus its attributes are negative ; it is mere nothing. And what kind of space is it that cannot be divided and which we cannot imagine ?" For him time and space are relative. Matter and motion are known to us only as forms of consciousness ; the essence of their being is to be conceived or known ; and the existence of a state of consciousness apart from a thinking mind is a contradiction in terms. Visual consciousness, for example, is merely a system of arbitrary signs which symbolize for us certain actual or potentially actual experiences.

These two streams of thought become confluent in the great synthetic brain of Kant. He gathered up in one system what his predecessors had to offer. While he was much impressed by the discoveries of Newton, was a mathematician himself and believed in a mechanical idea of the universe, the mainspring of his philosophic thought is to be traced to the influence of Hume. He believed with Newton that space must be regarded for practical purposes as enveloping everything ; but it has no

objective existence and is merely a form of our contemplation. His general argument as to space and time is that they are forms which objects must take on as objects of perception to us.

The Kantian synthesis has exercised a profound influence on all succeeding speculation. But the nineteenth century has witnessed an even more complete divorce of the subjective and objective attitudes to knowledge than that which followed the Cartesian philosophy. This is to be attributed to the enormous advance in the physical sciences which gave a certain prestige to the mechanistic hypothesis. But the most dramatic influence on the thought of that late period came from the doctrine of evolutionary biology as propounded by Darwin and his followers. While it was no part of the original teaching to explain the phenomena of life from a mechanistic standpoint, yet the main trend of biological investigation, and especially of experimental biology, has been along the lines suggested by Descartes in his interpretation of animals as automatic machines. There can be no question as to the enormous importance of the advances that have been made on this hypothesis. Even those who do not believe that vital reactions can ever be fully explained in terms of physics and chemistry are fully alive to the value of the discoveries which have been made from a mechanistic point of view. But that such a point of view is not indispensable, even in experimental physiology, is proved by the far-reaching researches of Haldane who never forgets that if we want to know where we stand with regard to our knowledge we must go back to Hume and to Kant.

Modern biology, however, is dominated by prepossessions which are comparable with the absolute time and absolute space of Newton. But even in mechanics and in astronomy the hypothesis of absolute time and absolute space no longer holds undisputed sway. Mach, in his anti-metaphysical *Analysis of the Sensations*, puts time and space in the same category with

sounds, colour and pressure, and in a series of illuminating observations shows how our spatial presentations are related to the physiological reactions of our organism. Mach is in the direct line of succession of those whose observations have culminated in the theory of Einstein, who says of him, "Apparently Mach would have arrived at the theory of relativity if, at the time when his mind still had the freshness of youth, the question of the constancy of the velocity of light had already engaged the attention of the physicists." The theory of relativity destroys the dogma of the independence of an absolute time and absolute space, and puts in its place the conception of a relative space-time system in which time is included in space as a fourth dimension. The new theory reverses the materialistic outlook on the universe. "For it mathematics does not take its subject matter from physics, but gives to physics the data of all science. The objects of physical science are mathematical constructions. They are not self-revealing objects which we find, they are objects *which we have ourselves fashioned out of the events which we co-ordinate.*"\* (Wildon Carr.) The validity of the Einstein hypothesis is to be found in the more complete conceptions which it offers of the nature of the universe, in the explanation it affords of certain discrepancies in the phenomena of celestial mechanics observed from the Newtonian standpoint, and in its conformity with the theory of electro-magnetic propagations. Its importance from a psychological point of view consists in the fact that, contrary to the notion of classical mechanics, according to which all differences in the appearance of events to observers may be calculated in terms of constant time and space and a variable velocity, there is no distance in space and no interval of time which is invariable and independent of the system of relative movement to which the observer is attached. It is a striking

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\* Italics mine.

substantiation of the views of Berkeley and confirms the philosophical reflections of Goethe that "all natural philosophy is, in the last resort, only anthropomorphism. We can at will observe nature, measure, calculate, and ponder it, but it always remains our impression, our world. Man always remains the measure of things."

The question now arises as to how far these reflections on the nature of astronomical time throw any light on the feeling of time or sense of continuity in our own experience. Astronomical time originated in convention, can be described and measured only in terms of space, and in its symbolic application in mechanics and astronomy is merely relative. According to the Einstein theory there is no space in the meaning of the old infinite void and no time in the meaning of the old time-order in which all events are fixed in a definite relation of past, present and future. Our consciousness of such time is the result of abstraction and of the employment of arbitrary signs and symbols in an endeavour to interpret the phenomena of an extended universe which has been projected by prolonged phylogenetic experience. We are conscious, however, of another kind of time, a time which is ceaseless in its movement and irreversible in its direction; it is related to the progressive movements of our growth and to the correlated changes in our experience; it is of the nature of something that is part and parcel of our existence as living beings; it is in the memory of the past, in the perception of the present, and will be continued naturally into the future. To time in this sense Bergson applies the term "duration." There is something elusive about it and we may wonder whether, after all, it may not be an illusion. At any rate it is difficult at first sight to see how it can be an integral factor in our organic reaction and conduct.

It frequently happens, however, that nature reveals the laws of her being more clearly in her perturbations than in the even

course of her way. The phenomena of disease have often provided the clue to the rational interpretation of physiological processes. So it is with the problem of the time which we feel ; in cases in which time goes wrong we are provided with the evidence on which we can appraise its significance in normal life.

A young woman of 25 years awoke one morning in Glasgow and felt she ought to get out of bed and prepare to go to school at Arbroath. Through a state which, for purposes of description, may be termed a "loss of memory for the preceding nine years" she imagined she was still a schoolgirl of 16 years and living with her parents in Arbroath. At the time of this incident she had spent the night with her cousins, sleeping in the room she usually occupied when staying with them. When she awoke she did not recognize the room nor did she recognize one of her cousins who brought her a cup of tea. She appreciated that something was wrong, but did not feel ill and betrayed to her friends no evidence of disorder apart from the fact that she did not know them or her surroundings, and that her memory for events in the interval of nine years had completely disappeared. About six years previous to this time her parents had died and she had come to Glasgow. She was engaged in secretarial work in a legal office and she lived in her own flat in the West-end of the city. She had, however, no recollection of the flat or of her work. She was taken into town by one of her cousins but she failed to recognize the streets ; neither did she recognize her office nor her employer, and when taken to the flat she did not feel that she had ever been there before. Every effort on the part of her friends to restore the lost memories proved unavailing.

I saw her on the following morning when, to all intents and purposes, she appeared to be normal except for the fact that a period of nine years had disappeared from her experience. There was no evidence of somatic disturbance ; she had slept well during the night and had a clear recollection of her experiences of the

previous day. She remembered that she had been in town, in her office, had seen her employer and had been taken to her flat, but her recollection of these facts had not, in any way, affected the loss of memory she had sustained. The gulf of nine years was still unbridged, and although she accepted as true the statements that her parents were dead, that she had been working in the office which she had seen the previous day, and that the flat she had visited was her own, she did not realize any of these things. She could play the music which she had practised before she was 16, but she could not do shorthand or typewriting which she had learned in the interval. She had absolutely no recollection of the events of the Great War and did not realize that there had been a war. Every effort on this date to restore the current of her experience proved fruitless. The mention of well-known places and persons and of sensational incidents in the War evoked no effective response, and her attempts to transcribe dictation into shorthand were ineffective.

She was a strong, healthy-looking woman, quite calm and composed though somewhat indifferent and apathetic considering the circumstances. Her expression was clear and intelligent; she did not look like the average victim of pathological amnesia and, apart from the loss of memory, there was no evidence of the classical signs of hysteria. There was no previous disorder of health which could be associated with the present phase. The only conditions which could be held to account for the disturbance were that on the day prior to the appearance of the amnesia she had had some anxiety about the means of returning to Glasgow from Arbroath on account of a railway strike and that, at the same time, she was in the prodromal stage of an attack of German measles which developed a few days later.

I did not see her again for ten days when she had recovered from the measles. There was no recognizable change in her condition. She had a normal recollection of the events of her life



up till 16 years, as well as for the events which had occurred since the morning when she awoke with the loss of memory, but of the interval she was still oblivious. She had been attempting herself, with the assistance of her friends, to restore the forgotten memories, but with no success. After using various devices I resolved to try her again with her shorthand. Having provided herself with paper and pencil I mentioned abruptly the name of a well-known legal firm in the city. Her face lit up immediately and she said, "I know that firm; they are in . . . Street." I asked her to picture the street in her mind and to follow it down to the next street. She did so and immediately remarked, "I used to work in the firm . . . on the opposite side of the street. Oh, yes, you go down the street to Renfield Street." She then began to name various shops and what she had bought in one shop and in another. She went from one street into another recalling her experiences with a wealth of detail which was marvellous. She was now in a state of mild exaltation, and though perfectly coherent and rational, the rapidity and accuracy of the recurrence of memory suggested that its restoration was under the influence of some automatic process.

As a result of this reaction the memories of a period of about two years were partially restored. These were in the early part of the war, but of the war itself she had as yet no idea beyond a hazy recollection that one of her employers had been called up. She had no recollection of the death of her parents and did not yet recognize her office, her employer, her colleagues or her flat. She did not recognize her cousins, except in the light of the acquaintance that had been formed in the previous few days. While perfectly able to form new memories the interval of nine years was still a blank except for the partial reintegration of the period referred to. I saw her again a week later, and during this week she had made no progress. She did not exhibit the liveli-

ness of interest or will-power necessary to enable her to help herself. I resolved on this occasion to employ the incidents of the War in the test to revive her memory. After several futile trials I mentioned the word "Petrograd." "Oh, yes," she said, "that is in Russia, Mrs. . . . lived there and came home to Arbroath after the Revolution." A process similar to that observed on the previous occasion was set in operation. She recalled with amazing rapidity and detail the names of famous Russian generals, the incidents relative to the Russian defection, the names of the notorious revolutionaries and the stories which were associated with their names. In this way was restored another group of experiences limited to a certain proportion over a restricted period. During the process she betrayed the same transient exaltation of emotion accompanying what appeared to be an automatic restoration in extravagant detail.

Following these two partially successful attempts to restore the lost continuity of experience there occurred from time to time little incidents which activated a new centre of association from which there spread, as on the previous occasions, a further process of redintegration. One of these is worthy of notice inasmuch as it exhibits the intimate relation of memory to emotional reaction. About three weeks after the onset of her illness she visited her flat, which she had not yet recognized as her own; in her bedroom "something about the wardrobe" struck her as familiar. She left the room and returned when, suddenly, she recognized it as belonging originally to her old home at Arbroath. This set up a revival of memories related to her parents and to the time she lived with them prior to coming to Glasgow. She remembered about their death, the selling of the house, and the setting up of the flat in Glasgow. She immediately saw all the furniture in a new light and the flat seemed to become all at once quite different. I asked her, when she related the incident, in what this difference consisted.

She thought for a moment, and then replied, "I believed you all when you told me it was my flat, but now I know that it is *my* flat," with particular emphasis on the "my."

The process of restitution proceeded apace. New areas of the amnesic field were gradually restored. She recognized her office and her employer, and was soon able once more to undertake her secretarial work. But even after three months the process was not yet complete. Now, however, her interest was concentrated, not on the experiences which had returned, but on the isolated patches which were still in oblivion. To these she directed her attention during the quiet of the Sunday afternoons, and in the course of five months the breach of continuity was completely spanned. I saw her at this time when she looked alert and vigorous, was animated in conversation and deliberate in those actions and attitudes which are indicative of character. The apathy and indifference which she exhibited when I saw her first had disappeared completely.

This is a somewhat rare form of amnesia; it is none the less suggestive on this account. It occurred in a healthy woman who had no previous history of nervous disease and who, at the time, showed no other signs of nervous instability. There was no exciting cause such as severe physical or psychic trauma. The only abnormal conditions associated with the onset were anxiety, thought of difficulty in railway transport, and infection by a virus which is not recognized as having any special affinity for nervous structures.

The amnesia, itself, was of an unusual character. It represented a loss in memory for experiences extending over a period of nine years. Consciousness of the events integrated by time during this period had gone. But there was no interference with the capacity for memorizing new experiences. Perception appeared to be clear. She had no difficulty in remembering *what she was told* about the events that were lost to her. She

was able to acquire afresh an acquaintance with her cousins, a knowledge of her flat, of her office and of the streets which she had once known but had forgotten. But that new knowledge while it remained under the cloud of the amnesia lacked something; it lacked the vitalizing influence of integration with the period of her life out of which it had grown. The effect of the loss was exhibited in a certain apathy and indifference which was recognizable to advantage only after she had become her normal self through the process of redintegration.

It was in the process of redintegration that the significance for the personality of the loss and recovery of memory was revealed. (1) The first successful attempts to restore the lost time were accompanied by automatic processes of memory, so rapid and detailed as to be quite out of alignment with the average possibilities of psycho-motor reaction, except in the matter of talk; that is to say, if her general behaviour had been in proportion to her flight of ideas she would have been in a state of maniacal excitement. (2) The reaction evoked by a recognition of her possessions and their associations showed how the knowledge of her flat acquired during the amnesic period required the emotional stimulus from a continuity of experience to give it its proper place in her personality. Through the influence of *emotion* the flat was once more part of her real live self. (3) So long as the amnesia covered the whole period she seemed to be quite unable to assist in her own recovery. There seemed to be an inhibition of *will power* for all forms of conduct which had reference to the experiences of the amnesic period. (4) The restoration of memory was accompanied by a renewed *interest* in her work and in the events she had forgotten, and her whole *personality* regained its former character and expression.

It is but rarely that an opportunity is afforded of observing an abnormality of the "time feeling" so apparently spontaneous in its origin, so complete in the loss of memory for a prolonged

yet well-defined period, and so satisfactorily resolved without obvious impairment of the personality. Far more common, though not more easily understood, are some of the allied disorders which supervened on the excessive strain or sudden shocks of war experience. An outline of the record of one of these cases may serve to indicate the extent to which a disturbance of "duration" may be associated with the dissolution of organic harmony.

A man of average physique and intelligence, with a good record of industry and conduct, joined the Army in 1915 when he was 39 years of age. He refused promotion as he did not feel equal to the responsibility. He had three attacks of malaria and had taken part in hand to hand fighting on several sections of the Eastern battle-front. On discharge from the Army in 1919 he is stated to have appeared well, though somewhat nervous. About three months after coming home he became depressed, irritable and sleepless, and occasionally looked dazed. He is reported to have taken "turns" at this time, and in these he became abstracted, confused and oblivious of his surroundings; he screamed and became so violent that he had to be held down. Between the attacks he was nervous and tremulous, apathetic and lacking in capacity for concentration and had no recollection of what had happened during the periods of maniacal excitement. He complained of headache and of giddiness and had no appetite for food. He was no less disturbed by night than by day. At one time he would be struggling, shouting and digging trenches in his bed; at another he would be searching the house and collecting rubbish. His aberrations of conduct were associated with a variety of hallucinatory phenomena. He imagined he saw the desert, dead men, flashes from bombs and blood on his hands. He thought he heard screams, aeroplanes and guns; and he complained, from time to time, of a foul odour from his hands. When free from the immediate influence of transportation to the

scenes of his experiences he exhibited signs of constant fear. He suffered from sensations of choking. He had to be accompanied in the street and he was continually watching the sky for aircraft. He would on no account enter a car or train, a church or a picture house.

The foregoing summary of his state has been made from an account given by his wife in 1919-20 to one of my assistants under whose care he was placed in November, 1920.

At this time he was so weak physically that it was necessary to take him to the clinic in a taxi and to help him to walk upstairs. His movements were slow and his cerebration was slow. He exhibited within a short period a great variety of emotional reactions. At one moment he would be grinning in a foolish and childish manner, at another he would be tremulous and appear frightened and miserable, and at another he would be apathetic and abstracted. His memory was poor even for events which had occurred a few minutes previously. He remembered very little about the War. He knew he had been in Egypt, that he had been in an engagement with the Turks, that he had fallen off a camel, and that he had had malaria three times.

There was considerable somatic disorder. On occasions violent shaking of the whole body was accompanied by profuse perspiration. At other times tremors were confined to the face, hands and legs. He might stagger and sway in walking, and often proceeded by high steps as if going over obstacles. He retched and vomited without apparent cause. His reflexes were all exaggerated and his pulse-rate was, as a rule, about 120 per minute.

He improved under sedative and "suggestion" treatment and in six months recovered sufficiently to be able to do some work. His weight rose from  $7\frac{1}{2}$  stones to 9 stones. His sleep increased to six or seven hours nightly and nightmares occurred

only about once a fortnight. Headaches were less frequent and less severe. He took his food well. Vomiting and retching had ceased, and his pulse-rate averaged 80 to 90 per minute. This phase of comparative well-being did not long survive his discharge from the clinic to which he was re-admitted in October, 1921.

At this time his old complaints had been re-established with their former severity. Severe headaches, violent tremors, vomiting, nightmares and sleeplessness were persistent features. Periodically he passed into states in which he showed no evidence of the excitement or agitation of somatic disorders. Tremors would cease suddenly, his gaze would become fixed, his expression abstracted and he would begin to enact, in a deliberate and dramatic fashion, the part he had played in some scene through which he had passed in his war experience. It was easy to waken him out of this psychomotor reverie, and when this was done and he became once more cognizant of his immediate surroundings, he became tremulous and agitated and complained of headache. His recollection for the events of his military service were still very hazy but he remembered "something about Gaza and El-Arish."

With a view to restoring his memory notes were made of the behaviour he exhibited in the hypnagogic state. When he could be induced to talk in this condition he described vividly, and in great detail, the nature of his imaginary surroundings. In one stage of the fugue his behaviour would be a repetition of some war incident—he would kneel down, ease round his water-bottle and open it, raise the head of a fallen comrade and give him a drink; the man having died, he would lay down the head on the ground, stand up straight, look down mournfully and make some remarks. By careful suggestion he might be persuaded, while still entranced, to talk about the imaginary scenes in which he was centred. If, in so doing, he came to a specially revolting

experience he would hold his head in his hands, grind his teeth and, complaining of pains in his abdomen, would probably lose the power of his legs. On being "awakened" he was encouraged to continue his narrative. He looked frightened, trembled violently, complained of severe headache and was induced, with difficulty, to recount the details of incidents whose recollection obviously produced great suffering.

The procedure of instituting and maintaining a continuity of experience between the trance and "waking" states was pursued over a period of four months. During this time sedatives were not given and neither on this nor on the previous occasion of his treatment at the clinic was he deliberately hypnotized. It is clear from the account of his behaviour that spontaneous self-hypnotism was the outstanding pathological feature of his condition, and the treatment resolved itself into an attempt to bring the experience content of these hypnotic states into line with the acts and feelings of immediate perception. His memory for the war events which formed the content of the fugues became gradually integrated with his ordinary conscious life, such as it was. Though still nervous and apprehensive, emotionally unstable and lacking in confidence, he complained less of headaches, took his food better, slept better and had only occasional nightmares. Associated with the reintegration of memory for a disagreeable past there was a decided tendency for that past to become less and less the embodiment of fugues. He was now able through the restoration which had taken place to give a rational explanation of many of his peculiar forms of automatic behaviour. He described, without being hypnotized, the disgusting scenes to which he related his retching and vomiting, and a habit he had of smelling his hands and wiping them on the floor or on his coat. Other habits, as well as hallucinatory phenomena, were referred to events which had been brought within the range of his recollection.



At the beginning of 1922 his health had so far improved that he was able to go about alone on the streets ; but that he was still far from well is indicated by the opinion of the doctor, under whose care he then was that " he is so unstable that he will probably be unfit to earn a living." The Ministry of Pensions, in compliance with regulations, framed no doubt with the best intentions, sent him to another therapeutic centre, and thence to an occupational centre in England. There he was supposed to undergo treatment and training as a ship's steward and cook. Whatever may have been the view of those who were conducting the experiment there can be no doubt as to its failure. He returned to his home in February, 1925, in a state of nervous debility which necessitated his immediate removal to hospital. His condition was much the same as it had been at its worst in 1921. He was restless and sleepless and disturbed by nightmares. He was nervous and shaky, and spoke with slow tremulous articulation. He had a facile grin and when asked how he was said he was " in the pink." He exhibited a proclivity to hypnotism similar to that which had been noticed on previous occasions. One morning, on going into his room I found him sitting on a chair by his bedside. He remained perfectly immobile, with his eyes fixed on a picture in a magazine. It was a picture of a battle scene. I took the book from him quietly and he rose and walked steadily to the opposite side of the room where he stood for a few moments. Apparently quite oblivious of his surroundings he acted once again the old scene of the water-bottle and the dying soldier. On being awakened from his fugue he trembled and put his hands on his head. I asked him somewhat abruptly how he was feeling ; he removed his hands to his side, began to shake and tremble and, smiling foolishly, said " I'm feeling fine." The apparent repetition in the description of his case is to be explained by the reduction of his personality to a state in which he harped on a limited repertoire, passing

automatically from one scene of abstraction to another and never capable of comprehending their significance or sequence, or their relation to his immediate surroundings.

At first sight it might appear as if this case had little or nothing in common with the one which was first described. In the first case there were certainly no persistent and violent shocks to the nervous system to account for the disturbance of mental equilibrium; nor did the nervous disorder find expression in abnormal reactions of visceral or somatic structures. The casual observer would notice nothing wrong unless it were revealed by conversation that a lapse of memory for a certain period had occurred.

In the second case the condition could be related to prolonged and repeated exposure to violent shocks and to the dangers and terrors of the battlefield. A nervous system, unstable to begin with, had become more unstable through attacks of malaria and on this account more susceptible to the disintegrating influence of agonizing experiences. In placing the two cases in the same category account must be taken of the fact that their common features are obscured in the second case by the more profound dissolution of the personality and by the accessory disorders of visceral and somatic reaction. Moreover, there failed to occur in the second case that process of gradual redintegration and re-adaptation, in the development of which anomalies of memory, emotion and will-power were brought to light. By discarding for the moment, however, the main points of difference, it is possible to recognize behind the more superficial phantasmagoria of disease a disorder of the "time feeling" to which all the other abnormal phenomena may be referred.

It would be misleading to interpret the disorder of "time feeling" in this case from the point of view of amnesia only. Admittedly he had at one time practically no recollection of his war experience; and that was so even when some of these

experiences constituted the foundation of his automatic behaviour. For purposes of description it is convenient to regard his consciousness as comprising, in addition to the ordinary conscious state, a number of accessory and abnormal states dominated by an exaltation of memory for incidents which had no place in his ordinary recollection. His memory in these abnormal or hypnagogic states was so vivid and so commanding as to render him insensitive to the influences of his immediate surroundings. One state of consciousness prevailed to the exclusion of the other; each found expression in its own peculiar mode of behaviour. His disability was due, not merely to *incapacity to remember* but also to *incapacity to forget*—his time was “out of joint.”

Viewing more closely the disarticulated elements of his behaviour we see that a disordered sense of time is related to defect of perception, distraction of attention and aberration of will-power. Bergson and his followers emphasize the importance of regarding the “percept” as a theoretical concept. The process or act of perception is the outcome of an organization of a series of percepts through “time” relations. The percept itself is spatially determined but it becomes effective only through the medium of those temporal relations of which conscious memory is the mental expression. Movement or behaviour we have regarded as the grand objective of animal existence. We may not be able to explain how consciousness mediates in the guidance of somatic reaction, how awareness which has no extension becomes co-ordinated with bodily movement which has, but we know that consciousness is related to what we call perception and that perception depends on the activity of the sensory system which brings the organism into relation with environment. The percept is the result of selective receptivity on the part of the nervous system. In its adaptation to the requirements of the organism it becomes articulate with organic memory which

preserves the continuity and identity of the individual. The percept through duration becomes perception, while perception and memory converge through consciousness on action.

Sherrington's conception of the part played by the simple reflex as an integral part of nervous action is comparable with that assigned by Bergson to the percept. Speaking of the simple reflex, he says, "there is the co-ordination which a reflex action introduces when it makes an effector organ responsive to the excitement of a receptor, all other parts of the organism being supposed indifferent to and indifferent for that reaction. In this grade of co-ordination the reflex is taken apart, as if separable from all other reflex actions. This is the *simple reflex*. A simple reflex is probably a purely abstract conception, because all parts of the nervous system are connected together and no part of it is probably ever capable of reaction without affecting and being affected by various other parts, and it is a system certainly never absolutely at rest. But the simple reflex is a convenient, if not a probable, fiction. Reflexes are of various degrees of complexity, and it is helpful in analysing complex reflexes to separate from these reflexes components which we may consider apart and therefore treat as though they were simple reflexes."

The analogy is obvious. The simple reflex has no independent existence; in playing a part in co-ordinate movement it must combine with other reflexes after a manner determined by certain temporal and spatial relations. So it is with the percept, which may be regarded as "a convenient, if not a probable, fiction." Percepts constitute the spatial basis of perception, but they function as perceptions only when co-ordinated by the temporal relations known as memory. In this hypothesis may be found a clue to the interpretation of our second case. His behaviour at any particular period was determined by the prevailing state of consciousness. The state of consciousness was in turn the

product of percepts activated by a particular phase of memory. The percepts excited by a war picture might be fused for a short time by a memory of his immediate surroundings. In that case he would tremble and look frightened. But if he continued to look at the picture an old field of memory would take command of the percepts with the result that he would be transported in consciousness to the old scenes of activity and would repeat in automatic fashion the behaviour which was adapted to the occasion. So hypersensitive was his feeling of time that in remembering the present he forgot the past, and in remembering the past he forgot the present. Viewed from this standpoint the disturbance of his mental equilibrium was manifested in an inability to forget as well as in an inability to remember. The stable sense of continuity or feeling of time wherein the experiences of life found their due place had become disrupted, and at any particular moment he was at the mercy of what might be regarded as only an average excitement. His *attention* was readily distracted and abnormally focussed on one illusory or hallucinatory field while he became, for the time being, oblivious to everything else. His *emotional reactions* were unstable and intense in proportion to the readiness with which he passed from the domination of one phase of memory to that of another. In these circumstances there was but little *will-power* left, for all that remained of his personality was represented in facile and terror-stricken reactions interspersed with periods of automatic behaviour.

It remains now to inquire whether our considerations of the problem of "time" throw any light on these phenomena, or whether on the contrary the phenomena of amnesia have any importance for a solution of the problem of time. It was contended that the doing of time and space, which is incident to all animal growth and movement, is prior to and conditionally antecedent to all ideas of time and space. The co-ordination of all animal movement depends upon the observance of certain

temporal and spatial relations in which adaptation is preserved both between the individual parts of the animal and between the animal and its environment. In the process of evolution the sphere of experience has increased in extent and in complexity *pari passu* with the differentiation of the organism and more particularly with the differentiations of the sensori-motor system. In the higher branches of the vertebrate phylum, especially in domesticated animals, adaptive reaction is so varied and perfect as to suggest a close affinity to the behaviour of the human species. Man, however, exhibits distinguishing features of a very extraordinary character. He can count, he can make implements, and he can talk. On the basis of these endowments and inventions he proceeds to give further evidence that he is a creative animal. This creative capacity, which is a product of his inherited capacity for doing time and space, carries with it a tendency for him to think in terms of the environment which he manipulates. He sees it, touches it and changes it, and in so doing, attributes to it an objective existence with which he, as an independent individual has to contend. The fear which he naturally feels is referred to the influence of unseen agencies or to movements in the external world which he does not yet understand. He applies his creative powers to the measurement of that world by arbitrary standards of space abstracted from the ideas of space which underlie his invention of numbers. He proceeds to measure the current of events or the feeling of time in terms of spatial measurement, another evidence of the process of selection or abstraction whereby he economizes his experiences. In this way he invents cosmogonies and cosmologies and astronomical systems, and thereby imagines he is discovering the universe of which he is a part, but which he imagines to be practically independent of himself. But these are all the results of the growth of his mental activity expressed in an effective use of symbols and the evidence of a creative capacity. They involve

ideas of space and time in a highly complicated context, but they are ideas which are ultimately referable to the simple acts of creation which spring out of the capacity for doing space and time.

Cosmologies and science are not, however, the only evidences of man's inventive genius. He has shown his creative power in literature, in art, in social institutions and, in a manner underlying all these attainments, in the creation of his own personality. It is to the product of this latter creation that we look for light on the disorder of time feeling which occurs in amnesia. Personality, like all human creations, has its origin in that period in the history of sentient nature when man took his stand above the other creatures by virtue of the capacity to count, to talk and to manipulate, and thereby to articulate in his mind a more or less definite awareness or consciousness of himself and of his surroundings. At this period, and in virtue of this consciousness, organic time (or automatic memory) became partly represented in conscious memory, automatic (or organic) emotion became partly represented in conscious emotion, impulse came under the influence of inhibition or will, and primary instinct became subject to reason and higher intelligence.

These elements which comprise the personality have their roots in the processes of animal life which preceded man in the phylogenetic series. They had gradually become more powerful in their influence and more complicated in their mutual relations. Essentially the product of hereditary and of internal organic regulation, the personality finds a wider and more influential expression in the social institutions which are, in their turn, the products of its creation. Personality, however, is in some degree the possession and product of every human being. Its stability depends on the stability of the nervous system which may be constitutionally weak or impaired by disease. Its tendency to dissolution depends on its original stability or instability,

and on the character of the forces by which it is assailed. But when it dissolves it may exhibit in its disintegration a derangement of the elements of which it is comprised. They may, and usually do, in part disappear; memory is affected, emotional reactions are anomalous, will-power is impaired, interest is lost and attention is abnormally sustained or deflected. In the process of reintegration memory is usually exalted, thus showing how in normal life a selection is made from impressions or perceptions adequate to the requirements of normal reactions. The restoration of memory or continuity of experience or feeling of time is imperative to a complete restitution, to a recovery of will-power, of interest, of attention, and of normal emotional reaction.

The dissolution of personality may, however, reach a stage from which rehabilitation is impossible. Such a consummation is usually associated either with hereditary defect or with acquired disease of the nervous system. There was no evidence of either of those conditions in the first case. The second has a son who is a feeble-minded epileptic. Epileptics are recognized as being specially prone to aberrations of conduct associated with anomalies of the feeling of time. Reference has been made already to the part played by counting in the evolution of the primitive human mind. That grade of mental deficiency known as feeble-mindedness is almost invariably reflected in an incapacity to count and read. The counting of the five fingers, it was pointed out, depended on a recognition of their similarity in space and of their succession as five in time. Printed words are the signs of the symbols of thought. In the case of a child with otherwise perfect vision inability to recognize words may be ascribed to a failure to co-ordinate percepts in time. That there is a faulty articulation of spatial percepts in time is indicated by the fact that, although a printed word cannot be recognized by vision alone, it can be picked out from a series of words when it is



pronounced. It is of great significance that the grosser disorders of time feeling are particularly liable to occur on a basis of congenital mental defect. It may be taken for granted that the construction of a stable personality is possible only on a sound neurological foundation.

Time is, then, the generic term for a series of relations which constitute the binding element in the creation we know as personality. Like astronomical time it has grown out of the doing of time. But, whereas astronomical time has been conventionalized by arbitrary signs and divided into years and their numerical sub-divisions, personal time is marked by the events of individual experience. Astronomical time has been symbolized in mathematical expressions and has been projected on a plan of the universe. In the theory of relativity it has been deprived of its status as an absolute entity ; it has been placed along with space in the category of a fourth dimension, and it has been ultimately reduced to the position where it began as an element in subjective experience. Personal time has never left the conditions in which it had its origin ; it began in the doing of time and it remains the essential link in the integrality of doing in the human sense.



## IV.

FOURTH SESSION : *July 25th at 8.30 p.m.*

*Chairman* : PROFESSOR WILDON CARR.

## SYMPOSIUM :

## THE ECONOMIC DOCTRINE OF THE CONCEPT.

PROFESSOR J. A. SMITH, DR. F. C. S. SCHILLER and PROFESSOR  
A. D. LINDSAY.

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I.—*By* J. A. SMITH.

LIKE an old-fashioned sermon this paper falls under three heads. In the first a doctrine is set forth, in the second a distinction is drawn, in the third a doubt is propounded for a consideration which is here initiated but not concluded.

## (1)

The doctrine in question is not in any degree original or novel. It is one towards which there has for long been from the most various quarters in the philosophical world a convergence rare in the history of philosophy. It has commended itself to many who have a right to an opinion though in some instances they neither claim, nor, if they did, would be allowed, the name of philosophers. It is not, indeed, universally accepted, but the measure of agreement with which it is held is so great that it may even excite a suspicion whether those who accept it can possibly mean the same by the terms in which they agree to state it, and whether, if these terms were made more precise, they would not be found to fall apart again.

However that may be, neither its origin nor its expression and development belong to any one thinker or to any one school. It seems to have suggested itself independently to some who would have called themselves Idealists and to others who would have called themselves Realists, and among its chief advocates are to be found Intellectualists and Sensationalists. It is a modern doctrine, but it is not of very recent origin. I made its acquaintance in a quite explicit form some forty years ago, and at that time it had already numerous partisans.

It is a doctrine concerning the nature of certain mental or psychical "entities" which had then and for some time before been labelled "concepts." There had been in this country - to confine ourselves to that—in the first half of last century much controversy concerning the proper denotation and connotation of this term, a controversy which reverberates to our own day. Definitions of the meaning of the term were offered, canvassed, rejected, amended, &c., but the divergences between them seemed in a fair way to be reduced to a question of more or less: this was too wide, that too narrow, but such differences scarcely amounted to differences of principle. True, logicians still seemed to fall apart on this topic into the warring camps of Nominalism and Conceptualism, but in the view of many outside the circle of the disputants this debate appeared a mere war of words, and its futility to point to a *via media* on which both sides might come or be brought to agreement. Outside the schools it was beginning to be felt that the term had come to possess a sufficient fixity and determinateness of meaning to be employed by men of science, if not in their science, at least in giving to the non-scientific world a well-informed account of what was present in their minds and there employed in the actual business of extending the sciences. By the employers of them, "concepts" were among the contents, furniture or apparatus of their minds, distinguished from the primordial data of experience, whether single

or grouped, and again from the recurrences of these in broken or attenuated images, and recognized as late products in experience, by contrast with the rest factitious, artificial, capable by effort of elaboration and improvement and of great or essential importance to the characteristic life of the scientific mind. They form an element or factor in the judgments or propositions out of which the fabrics of Science are built up, and, compared with the other or correlative factor in such judgments, viz., the immediate data of observation, the more important or—if I may venture to use a modern biological metaphor—the “dominant” as opposed to the “recessive” factor. It is with such entities as they exist in Science and as they appear to the man of science when he reflects on what is going on within him that I am here concerned, and I think it sufficient for their identification to say that they are the meanings of the technical terms used in the expositions of the several sciences. These occur chiefly as the predicates in their statements, but are also frequently to be found as the subjects, in the latter case subjects and predicates being equally concepts and the statements alleging some relation to obtain between concepts. So important is the latter case that the whole, or the major part, of what any science has to say may be regarded as one complex concept, and so as consisting of an assemblage of concepts the relations between which belong to the nature of the concept equally with the relata (the concepts) which they connect. In fact, it would be in the spirit of this view to regard Science, so far as it can rightly be taken as a whole, as one vast concept or concept of concepts, and the aim and office of Science as the extension and improvement of this.

Of the existence in our minds of this great architectural structure there can, I think, be no doubt, nor of the advantage to mankind of its existence and of success in efforts to improve it, nor any about its distinction from the spectacle of observable phenomena or from the natural or artificial copies of parts of that

spectacle in memory or imagination. It has justly excited the wonder and curiosity of the mind which finds it extant and growing within itself or among its contents.

But its existence gives rise to many difficult problems as to its intrinsic nature and its extrinsic relations. It is a whole of parts, and these markedly homogeneous or homologous with one another and the whole, but what sort of a whole is it, or is on the way to becoming? Is it an object which can be examined like other objects? Or is it a function or an operation, perhaps highly complex, which does its work occult from observation, and is only inferred from its observed effects? Has it grown up, or was it there from the beginning, lurking and working in the dark, perhaps only occasionally emerging when it tended to go wrong? Is it a gift of nature, or a product of mind's own generative activity? How is it related to the real or supposed world of things as they are in themselves, after knowledge of which we, hopefully or desperately, aspire and endeavour?

There seems a fair measure of agreement—greater among men of science than among philosophers—on many of these issues. Thus at least it appears to be agreed that, as it now exists, it is an historical product, that it has grown or developed into what it now is, and that its author and improver is the mind in which it now exists; also that from henceforth any improvement in it involves much painstaking watchfulness and forethought so that if its beneficent help is to be continued and promoted, its further elaboration and systematization must be pursued in the growing light of consciousness. And though no doubt for a season the increase of light will make us less efficient in improving it, in the long run this embarrassing effect will wear off and in time we shall learn to do the old work better under the new conditions.

But to succeed in this it is indispensable that we should clear our minds as to the nature of what that is which we are concerned

to improve—clear the view of it from distorting or falsifying misconceptions, and it is here that the doctrine of which I speak offers itself for our assistance or guidance.

Like all doctrines, this has both a negative and a positive side, and I begin with the former. The concept (and so the concept of concepts) is not an object or product of Thought and no thinking can develop or improve it. But as the word “thinking” is distractingly ambiguous, in what sense of it, let us ask, is it held to be incapable of producing or improving any concept whatsoever? In the elucidation of what is meant it is necessary to assume two distinctions: (1) that between Knowing and Acting, and (2) that between what is and what is not altered by something that happens in us. In respect of the first distinction we assume that, while either may occur or pass in us, they are, however difficult it may be to say which of them is present, in themselves distinct and opposite sorts of experience. The second distinction comes in when we try to express the difference between them; in the case of acting we are altering something from what it was before our acting to what it is after that, while in the case of knowing we are not. Or, to put it otherwise, in both cases we presuppose a given or extant state of affairs, which in acting we alter, while in knowing we leave it unaltered. Observe that in both cases something which we call the self is altered or alters itself, but that, while in knowing nothing else than the self is altered, in acting there is always a concurrent or consequential alteration in what surrounds the self. Now what is here called “thinking” means any and every process which is an advance in knowing, and so imports no alteration anywhere outside of the knower, and in him none except from not-knowing to knowing, or from less to more knowing (we may ignore for the time the converse alteration). If in English we could use *knowing* for the process which ends in knowledge (or more knowledge), we might express the negative

side of the doctrine in the words "conceiving (*i.e.*, framing and elaborating concepts) is not knowing"; in view of the resistance of English idiom to their use all we can say is, clumsily, that "conceiving is not a cognitive process" or, ambiguously, as above, that it is not "thinking." That in this negation the doctrine is not attacking a man of straw may be seen from the frequently repeated counter-statement that it is by "judging" that we form concepts and by "judging" that we re-form them, that to "use" a "concept" is "to judge," and conversely, that to relate or combine concepts is "to judge," &c., &c.—in a word that "judging" (*i.e.*, the process which effects an advance to or in knowledge) is "conceiving" and *vice versa*. Further, if a judgment is the result or product of judging, judgment and concept are synonyms one of another. No doubt those who hold this view continue to distinguish between conceiving and judging, the concept and the judgment, but (generally at least) with the gloss that they are but different degrees of the same, lower and higher or implicit and explicit (enfolded and unfolded) phases or stages in knowing or knowledge.

There are many reasons for holding that a concept is not itself a form of knowledge, and neither produced by knowing nor a stage in knowing, but one may suffice. If I *know* something I am in a position to "explain" that something, but I may have a concept (and quite a good concept) and be ignorant of whether anything exists of which it is the concept, and *a fortiori* be unable to explain it, to say why it is, and why it is what it is. Science, which is as we have seen the framer, improver, possessor and employer of concepts, warns us that from it we are not to expect "explanations" of anything, or explanations only in the limited sense of a restatement of the complex in simpler terms, that is, not what we seek in the way of explanation at all. It declines the office vulgarly thrust upon it of interpreting the facts of experience. What it does is to construct, reconstruct and employ

concepts, and (by its own account of itself) it is not thereby better able to explain or interpret what is explainable or interpretable than non-science, than common sense or Philosophy. Concerning the real meanings of things it declares *Ignoramus et ignorabimus*—no possession or use of concepts now gives it any advantage, and no improvement of its concepts will or can give it any advantage in the future. It may form and reform these as it will, build them together into a fabric as wide as the universe, it will thereby not reach knowledge or understanding, no nor come nearer to it by a single inch.

Assuredly I am not maintaining that Science carries on its proper work in the darkness of ignorance, or that those whose hearts are set on the increase of light or the lifting of the veil that hides the real from our sights, would be right in expecting from it no aid to the realization of their heart's desire. It is rather men of science who bid us expect from them no such assistance. What I do maintain is that their concepts are not sources of light, that by no improvement of them, by no coupling of them, by no compacting of them together into the whole which Science labours to construct, can one spark of illumination be lit or quickened to irradiate the obscurity of the real, whose secrets we would fain learn and know. Nor for all this does it follow that the lovers of light should view the busy labours of men of science as those of men pursuing an end other than and unrelated to their own. How their several ends and their progresses towards them are related we may learn when first we have learned how they differ.

The positive side of the doctrine (like the doctrine of Relativity) has two forms, a general and a special form. In the general form it pronounces the concept to be *quid practicum*, having its source, place and work in the practical sphere, that is in that realm of experience where the mind's activity is engaged in altering what lies outside itself, and where, what it when successful



produces, is not knowledge or truth but good. But it has proved almost impossible for the account to rest in this general form, and it almost at once assumes the special form. Further, of two (abstractly possible) special forms it always takes the one, and the other has not as far as I know been preferred by any. It is advisable to refer to that other only because adjectives are sometimes applied to the concept or to some concepts which, strictly taken, import it, such as *e.g.*, "necessary" or "universal." In the arguments or pronouncements in favour of the doctrine the general and the special form are for the most part confused together or at least not distinguished. I will not multiply quotations; I will only remind you how frequently, and with what increasing frequency, we find concepts characterized by men of science, as contrivances, devices, instruments, &c., &c.—words appropriate to the products, means, &c., involved in the processes of realizing practical ends or goods. To make my meaning precise, I call the general form of the doctrine "practical" (or "pragmatical") and the special form "economical."

The defence of the doctrine in the special form in which I hold it involves two theses:—

1. General.—That the concept (and so the whole of the concepts which exist) is in origin, essence and destination or use and exercise, wholly an affair of will.
2. Special.—That it is originated, maintained, developed, organized, employed by particular acts of will directed to and achieving particular goods.

The latter being the more distinctive and the more likely to be controverted I turn to the elucidation of it. Its contention is that the concept of science is always a particular good or, to be quite plain, an individual good, the goodness of which is confined to a unique situation, in which, if it is fully used, it is used up or consumed. In fact, it is not merely analogous to,

but identical with, the good of the ordinary economist, properly defined. It is literally a "commodity" (or "utility" or "opportunity")—no doubt a very special or peculiar sort, but still centrally and essentially a "commodity" and it has all the attributes belonging to a "commodity." Its end is to be consumed, and when "economically" used in and by its consumption it produces, not knowledge, but more and better of its own kind; it is a means, but a means to an end homogeneous with its own nature. And its particularity cleaves inseparably to it, no matter how it be dissolved into lesser concepts, and these re-aggregated or strung out in order or series; a group or series of concepts is just as particular as its items or terms. Further, the linkages between such items or terms on a conceptual whole are themselves particular. The one thing that cannot happen to it is that it, or anything in it, should become or be made universal; to universalize it would be to annihilate it or to transmute it into something other than a (scientific) concept. On the other hand, no harm (but rather good) is done by "generalizing" it though we must be jealous of departicularizing it and must stand firm against deindividualizing it.

The doctrine then is that the essence, the soul, the *forma informans* of what we call the concept and therefore of every science and all science, is particular or individual utility; its final or ultimate cause is to be used and to be used up—when it is prudently or wisely used, so as to produce a greater utility of the same kind. The metaphor implied in calling this utility the *soul* of the concept may serve to remind us that the actual or concrete concept as it occurs in our experience is an embodied soul, and it may be asked, with what body does it come? The answer is simple; its body consists of sensible or imaginable matter, it is clothed upon with imagery and through that it operates and fulfils its functions. It is incorporate in sights and sounds, or in their decaying reliques in memory and imagination;

it lives and works inobservably behind diagrams and graphs and the sounds of speech linked and ordered in the spoken or heard or written or printed words. They make up its organized and instrumental vehicle, but these are not *it*, they are but its trappings and its suits. We must not forget this, its shifting and perishable psychic body, but we must not confound it with its inward soul. But equally we must not call this central essence its *mind*, for it neither understands nor is understood, it is dark and enlightens nothing; it works, that is all; in its working lies all its being and its worth.

It must be evident that as a theorist of the concept I am a whole-hearted Pragmatist, and, though I hold my Pragmatism in a special or particular form I in no way qualify my adhesion to the general form. The only good reason I know for maintaining in my mind any concept is that it works, economizes effort, saves labour and is such that it costs too much trouble to do otherwise. And I justify myself in the value I attach to Science because I see no other way of extending the *regnum hominis in natura*, the command by man or mind over the resources available to him or it. I think myself a little wiser than many of my brother Pragmatists because, while I hope I do not neglect universal good or the acting planfully for its realization, I try to keep a constant regard to particular or individual goods and to the ordering and organizing of particular acts to secure them for myself and others. And in this latter business where shall I find help so fully vouchsafed as in and from Science? I should be most ungrateful not to acknowledge such benefits received and most unwise not to continue asking for more of the same.

There are, I am well aware, some practitioners of science, and more amateurs of it, who will be disappointed and even angry at the refusal to credit it with no more and no other character than this serviceableness. To such, and perhaps to my

audience generally, it will appear most paradoxical to regard Science as, however *fructifera*, not *lucifera* at all, for what is Science but *scientia* or knowledge, and what does "scientific" mean but making and promoting knowledge? "The scientific worker, it has been said, has elected primarily to know, not do. He does not *directly* seek, like the practical man, to realize the ideal of exploiting nature and controlling life—though he makes this more possible; he seeks rather to idealize—to conceptualize—the real. . . ." Now it is doubtless true, and common ground, that what he hopes to reach in the end he does not attempt to grasp *directly*, by a leap or jump at it; he approaches it by "conceptualizing" the given conditions of it, which are here described by the author as "those aspects of reality that are available in his experience," *i.e.*, those facts which he knows or can find out *before* "conceptualizing" them. He must have some knowledge before he conceptualizes it, and when he has finished conceptualizing it, what he hopes to find himself doing is not knowing but, "like the practical man," "exploiting nature and controlling life," with perhaps an outlook beyond that to what the author speaks of as enjoying Nature (either in emotional or artistic moods or in seasons of craving for a satisfaction to his "inborn inquisitiveness"). Meanwhile, that is, during all the time that intervenes between the opening of his mind wider and wider to behold "those aspects of reality which, etc.," and the direct exploitation of the real as a source of satisfaction to his æsthetic emotions and his intellectual cravings, what is he engaged in? The author's own answer is, in "making a working model of the world." Surely that is plainly a practical activity and it is at the same time the whole and sole scientific activity. The science which he makes and the working model which he constructs are the same.\*

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\* He calls it a "*thought-model*," but that only means a model made of different stuff from that of its original.

But I have lapsed back into a defence of the general form of the doctrine, which I might have safely left in the hands of M. Bergson. I have no doubt that, so far, it is shared and welcomed, as an account of what they are at, by the more thoughtful men of science at the present time. But if this be so, I think that upon reflection they will also share and welcome the special form of it, for what it ascribes to them is a special efficiency in their chosen business, a wise disregard of pseudo-idealisms, a close application in and to what they are doing, and I recall how once William James in conversation offered in the statement of his Pragmatism to substitute the word "particular" for "practical." It is with no design to belittle the worth of Science that, in defining what I take to be its nature, I follow his lead and characterize the whole activity of the scientific mind as not only practical but particularly practical, its practicality descending or condescending to the most minute details of its endlessly fruitful or profitable business. And that business is by common agreement, if not wholly and solely, yet primarily, habitually, and distinctively the construction, improvement and use of concepts. The concept of concepts which it incessantly makes, unmakes and remakes is a particular or individual working model of the known world, and while, to make it, the original after which it is fashioned must first be known and may after it is fashioned become better known, the making of the model is not the knowing of the original and the model made is not the original known or the knowledge of it. It is perhaps a means to the knowledge, but, if so, it is a means which perishes in the knowing, and in the light of knowledge Science pales and vanishes like the stars at dawn.

## (2)

*But . . . distinguo et distinguamus.* While I withdraw no syllable of what I have said in this account of the origin, nature, office and end of the concept, there is a possible and all too

widely held error which is apt to be blended with this doctrine. There are other entities, in all ways distinct from these, which have for ages been confounded with them under the name of the concept and of these this doctrine does not hold. There are what in the history of Philosophy have in the endeavour to distinguish them received the designation of "Categories." Unfortunately, almost as often as the distinction has been drawn, it has been blurred again. But, as I believe that it is one of the articles in the philosophical *Quicunque vult*, I beg leave to say a few words about it. Categories have with the concepts of science, so I hold, as little in common as is compatible with their both being in experience, or involved in its make-up, and can have predicated of them no characters which are unequivocally the same—perhaps not even what I am willing to predicate of both alike, that they are spiritual entities or essences. But at any rate—

(a) "Categories" are, as the concepts of science are not, universal or universals. They are literally everywhere and always, are wherever and whenever any being is at all, can nowhere and never be absent, while concepts have always a determinate or limited range within which they are present, and even within that are imperfectly pervadent or co-occupy it with endless others (though no actual number of concepts can exhaustively permeate any such field).\*

Categories *are* universalities, that is, the natures of universes. To borrow a phrase of Leibniz's, each Category is a "possible universe," self-contained, autonomous and harmonious, and within its universe it is *totum in toto* and *totum in qualibet parte*. I have with some reluctance, and only provisionally, called it a "possibility," for it is such a possibility as is also and at the same time

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\* For this reason the concept necessarily falls short of concreteness, or always remains "abstract."

an actuality. It is the actual plan or scheme of a universe, a scheme actual down to its minutest detail, but to be an actual universe it wants a *complementum possibilitatis*, which is supplied by other Categories. Though each within the universality which it is is omnipresent and everywhere wholly present, it is so in different degrees, with a varying intensity or remissness. And what is true of each in distinction is true of all in union. There can be, and therefore certainly is, in the end but one Category, the Category of all Categories, and all Categories are domestic differences or differents within it, and so differences in degree. It is idle to seek for an image or model of it, for it is unimaginable and we possess the original, and because this is so, it cannot be expressed in words, or only with the perpetual gloss that, because the expression is in words, it is inherently and irremediably defective. But it would be a fatal and inexcusable mistake if, because of its essential ineffability, we should believe that in itself a Category and *a fortiori* the Category of Categories possessed no systematic or articulate structure.

A Category is, as again the concept is not, an object and an object of knowledge; it is necessarily illuminated, it lives in the light and by its existence, which is inseparable from its being known, is a source of light upon what lies beyond itself, *i.e.*, other Categories. It is universally knowable, *i.e.* is intelligible. But, as I have said, its intelligibility varies in degree, and it is just this which introduces into the categorial universe whatsoever variety or multiplicity it possesses, and distinguishes so far as it is distinct, one Category from another. The universe has in no human speech and, therefore, not even in the most philosophical vocabulary, any nomenclature or phraseology of its own, and it might seem idle and inconsistent in me to name any instances of Categories. Nevertheless, I venture to say that what I call Categories are the meanings which are signified by such words

as "unity," "existence," "causality," "rationality" or by certain inflections of words (themselves signifying concepts) which imply such meanings or are signified and understood (*subintelliguntur*) without any "part of speech" specially conveying them. Being themselves non-particular, they can have no particular signs standing for them. We are acquainted with them only when we understand them and in understanding them.

Because of their universality together with their objectivity they are distinct from other objects of knowledge more directly and immediately than from concepts, viz., from the particular objects of the senses and the imagination with which they have in common the being objects or objective. And again, because they are universal, they are closer in nature to certain non-objective entities than to concepts, viz., to such practical entities as moral goodnesses or ethical activities, operations or acts. From concepts they are doubly distinct, first by their theoretical nature (their knowability) and second by their universality (though I have hitherto put these *differentiæ* in the reverse order). On the latter *differentia* I have dwelt perhaps too long and at the risk of their confusion with universals which we can or do enact but which we cannot understand. On the former I will be briefer. Surely by a Category we mean something which is knowable, which is in a measure known to us, and by being known is the source of further knowledge, knowledge of something other than itself, and we cannot suppose that what is and gives us this is a thing of our doing or making, that it is done or made at all; it is but discovered, discovered to be in our possession and to our enlightenment by further discoveries. It does no work, it is not expended in the exercise, however enlarged, of its function; it overflows into actuality without diminution, *ἐκ πλεονουσίας*. The more brightly it glows the wider is its field and *vice versa*. Could anything in experience be *more* different



from a concept ? Concepts are our creatures and our servants ; these are the lords and masters of our experience shining upon it from above and enlightening our experience, ourselves and our world. Without them we should be blind gropers in the dark, and we cannot compel them to do our bidding. “ ’Tis not in mortals to command ” them ; we can but labour to deserve their aid. They are gifts to us—the bounty of Nature—and they cannot be constrained.

## (3)

I now come to the statement of my promised doubt. Hitherto I have assumed that the distinctions between knowing and acting, and between what is universal and what is particular or individual, stand fast and cannot be removed. And now I am not sure, and my foundations seem to slip and slide beneath me. For experience—so I now remind myself—is assuredly one and homogeneous, and any fixed or absolute partition of it into such distincts in the end (and therefore from the beginning and throughout) indefensible. Have we not Bosanquet with us (who “ being dead yet speaketh ”) to remind us that the truly universal and the truly individual are one, universality and individuality but two names for one nature ? And are similarly true knowing and true acting not also the same with another, contingent aspects of one reality whose apparent difference of look as we gaze closer itself vanishes ? And, as these great distincts dislimn in the blaze of metaphysical light, does not the dependent distinction between Category and concept vanish with (or before) them ? To me at times it seems so, and I have but little faith in a sometimes promised return or reinstatement. As I dally round the portals of the *adytum* of Absolutist Metaphysics, I read all too clearly the legend upon them *vestigia nulla retrorsum*, and I have no confidence that in the new noonday splendour the old familiar stars will or can re-

appear. Yet I am disquieted, and in what I have said earlier in this paper I no longer find undisturbed satisfaction.

The contrast or antithesis between a Category and a concept is not as absolute or diametrical as I had supposed. The two lie on the same line or scale, the one but higher and the other lower. And if so, each partakes in the nature of the other, and so the Concept is not *purely* practical and the Category *purely* theoretical; the one does enlighten because it works, and the other works because it enlightens. The blind will and the inoperative intellect are both chimeras or fictions; it is impossible to do or make anything without thereby increasing light and understanding, and it is impossible even to profit by light without thereby realizing some practical good. To be quite plain, it is impossible to alter oneself without altering what is not oneself but one's world, and the whole of one's world, and equally impossible to do the converse, and the alteration will always be at once and indissolubly a change from what is practically worse to what is practically better (or *vice versa*) and a change from ignorance to knowledge (or *vice versa*). The self (and its experience) "moves all together, if it moves at all."

Thus the advance of Science is also the advance of Philosophy, the construction of conceptual models is the discovery of the structure of the categorical universe; neither is before or after the other, each is but a form of one process and each therefore a form of the other; they are not allies, for they are the same, *πολλῶν ὀνομάτων μορφή μία*, "the Form that abides, the Function that never dies." This Unitarian doctrine, I confess, at once draws and alarms me, and I can neither surrender myself to it nor forget it. I shrink from the prospect of a consummating vision in which all differentiations vanish or rather betray their nullity, their lack of justification in the really real. The most I can do is to hearten myself by opening the eyes of my fellow students to the same prospect as my own fearfully behold. There is at

least one great hierophant who proclaims that from where he stands now none of our old distinctions are visible; having reached what he bids us strive towards, by turning our back on Science and its works, and straining away from that "relative and symbolic knowledge by pre-existing concepts which passes from the fixed to the moving" to that "intuitive knowledge which installing itself in the movement and adopting the very life of things attains the Absolute" Bergson reports that while the spectacle that then presents itself is still an articulated or structured whole its self-distinctions do not coincide with or confirm those to which in science or even in philosophy we have been accustomed; our categorical no less than our conceptual frameworks are an empirical, subjective, transitory net-work spun by us between us and the real which must be removed, if we are ever to behold the real face to face, that is to know it or to *know* at all. From the promised revelation I have said that I shrink. I could wish for a better conscience in my resolve to stay outside, but I do stay among those incomplete adepts who still look through a glass darkly.

And so, while I acknowledge that my present philosophy may be but a provisional and penultimate version of what it ought to be or must become. I must repeat that, *if and so long as* I with others distinguish what is theoretical from what is practical we are bound to say that the concept, any and every concept, and so all science, falls under not the former but the latter head, and that, similarly, *if and so long as* we make and justify the distinction between what is universal and what is individual (and make or find it no less within the practical than within the theoretical sphere) we are bound to say that no concept is universal, but each and all individual. And the best single name I can think of—the one which most helps us to bring and hold together what is most profoundly like and concurrently to separate and hold apart what is unlike—to signify its essential

nature is "economicity" (or with slightly lesser aptness), "commodity," "utility," "convenience," &c., &c. I protest that I mean this quite literally or prosaically, *i.e.*, that I regard the essence of the concept as *identical* with the essence of the ordinary "goods" of the business world. In the one case and the other its value or its use-value is what it *is* (*res ipsissima*), not something which it has. In both this is, as I have said, embodied, and even the ordinary economist knows (however reluctantly he admits his knowledge) that that in which economic value resides need not be either external (to the skin of its owner or user) or material; it may be internal and psychical. In both regions the powers or forces which are at work are not naked essences, but inhabit, pervade and work through organized "matters" which are, whether psychical or physical, heterogeneous to their active centres or cores, and these "matters" have in common this at least that they are neither thoughts nor the products of thinking; from these too they are heterogeneous. Hence not only is the abstract (which is the real) concept not a thought, but the concrete concept is not so either. Neither is a thought which works, but a working which ministers *ab extra* to the activity of thinking or knowing; it can never enter into the kingdom of knowledge, or, if it can in any sense be said to survive in the knowledge to which it is a means, it must undergo some transmutation in which its identity with its past (*i.e.*, its new present) self is unrecognizably lost. That change must be even greater than that by which a natural desire or action for the satisfying of it becomes moral, for that is but the universalization of the individual. In order to the conversion of a concept into a category there is required beyond this (or on the way to it) the transformation of it from a practice into a theory, from an action into an intellection. I do not say that in the alchemy of our mind such changes are not effected and take place, but, if and when they do so, the manner of it escapes my comprehension nor do

I think it a matter capable of deliberate or planned regulation by any man singly, no nor by all together. The whole transformation of energy (the power of doing work) into light (which does no work) is a mystery as inscrutable in the life of Mind to Metaphysics as it is in the life of Nature to Physics. But, however that may be, it is at all times incomplete, and in the Universe there remains on the one side a region or level within which forces do their work darkling and a region or level in which light expands without expenditure of its energy; the one can be regulated without being understood, the other understood but without being regulated; of the one a working account can be framed which is part and parcel of its working, of the other a theory can manifest itself which illuminates itself. But how these two are related or in what manner each ministers to the other—in the macrocosm of the whole or in the microcosms which we are—that we cannot say and we can speak of it only in paradoxes and riddles, not saying even so what we mean or meaning what we say. And, come to this pass, I end by saying that the doctrine of the concept which I have offered makes no pretence to be a theory of it or to throw light upon its nature, and the doctrine which I have offered of the category makes no claim to work, or in any way to stimulate or strengthen or direct the will. Nevertheless I am convinced that in any other rival doctrines as yet offered to me there is even less wisdom than in these.

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## II.—By F. C. S. SCHILLER.

I SUPPOSE that those who are not fortunate enough to be philosophers are apt to think of philosophy either as an abstruse sort of game based on the systematic misuse of a technical terminology, invented expressly for this purpose, or as a sort of ineffable vision which, though not strictly intelligible nor transferable from one mind to another, is yet able to strike a responsive chord in other minds sensitive to its appeal, so that they forthwith sink into a discipular attitude, and declare themselves the followers of the philosophy which has moved them. There is that in philosophy which lends itself to both these mistakes, and the Economic Theory of the Concept also might perhaps be mistaken for philosophy in one or other of these senses. I myself had never been able to understand what I had heard about it, and used in my ignorance to think it was the natural opposite of the many *extravagant* theories of the concept with which I was acquainted, and to imagine that it might be allied to that delicious sanctification of human indolence, the Law of Parcimony. I have in consequence learnt a great deal from Prof. Smith's paper. Not, indeed, as much as I should have liked; for many aspects of the matter still seem dark to me, but enough to ask for more illumination. And what Prof. Smith has told us has so whetted my appetite that it is not unreasonable to hope that he may be willing to enlighten me still further. But at present I have great difficulty in providing as coherent a discussion of Prof. Smith's doctrines as they deserve. Originally, I was given an earlier *avatar* of his present paper, and when finally I obtained a brief glimpse of its actual form I had no time adequately to consider it or to re-cast my own paper. I greatly fear that I shall have substantially to confine myself to a string of questions, largely

terminological and not always wholly relevant, but console myself with the thought that the basis of all agreement must always be agreement about the use of words, and that in philosophy this is particularly hard to reach. For philosophers have a deplorable knack of using their terms in a highly individual way, so that it can by no means be taken for granted that because they use the same terms, they mean to convey the same meaning. More commonly they talk at cross-purposes, and a philosophic problem, when thoroughly probed, frequently develops into a "Your 'God' is my 'devil'!" situation.

(1) The first stumbling-block I came upon in Prof. Smith's paper concerns the meaning he attaches to the term "concept." His use of this word is certainly not one that is familiar to me, nor does it strike me at first sight as likely to prove convenient. He tells us that "conceiving" is not "knowing" nor "thinking" nor "understanding," and has nothing to do with "judging" or "reality." A "concept" therefore is not the "explanation" of anything. Nevertheless "concepts" are framed, used and improved by the sciences. How Science frames concepts, what it uses them for, and how it improves them, I did not clearly apprehend. Nor do we seem to be told what Prof. Smith meant by a "concept"; he does not define it, but indicates only its denotation, the sphere of its application, as the "practical." This lack of definition subsequently renders it difficult to grasp how a "concept" is to be distinguished from a "category."

Next I failed to apprehend what was meant by saying that the "concept" was "in origin, sense and destination, or use and exercise, wholly an affair of the will." In what respect is it more volitional or purposive than any other product of rational, i.e. purposive, thought? And what is the scope of this doctrine? Does it mean that there is no such thing as a "theoretic" use? Does it mean that theoretic thinking is devoid of purpose, use and destination, and is a wholly random, or mechanical, affair?

Does it aim at no end and no good, and is it false that "good" is merely a synonym for "end"? If, on the other hand, the thinking process is purposive, what difference does it make whether the good or end it aims at is "particular" or "universal"? What in any case is the difference between them, and what example can be given of actual thinking in which the end is perfectly particular or absolutely universal?

Perhaps the only positive thing we are told about the "concept" is that "it works, that is all." That would be no mean achievement, if it were true; but I have not been able to conceive how a concept conceived as it is by Prof. Smith could conceivably "work."

(2) I cannot quite make out why Prof. Smith calls a useful concept "economic." For economic use would seem to be only one species of the wide genus usefulness. Does not the "useful" properly mean that which serves as a means to an end, without restriction of ends? Unless therefore all ends are economic, why should the means, devices, or fictions, we employ for predicting and controlling the course of events be called "economic"? And even if we agreed to this use, it would need to be specified further. Is the "economic concept" analogous to (or identical with) a commodity or an instrument of production? Does its value partake of the nature of value-in-use or of value-in-exchange? The latter can hardly be what is intended, since there is no exchange involved in its use; yet unless exchange-value is meant (and it is indicated by the reference to "economic goods in the ordinary market") why should it be said to be "used up" in its use? If, on the other hand, value in use is meant, it is still more difficult to see why this value should be described as a transitory phenomenon. For the use of a concept (as I understand it) seems to *increase*, not to destroy, its value. If you have formed the concept of a "bore," and found it useful in apperceiving the social behaviour of some



men, it surely does *not* perish in that use ; but the more "bores" you encounter the easier it becomes to recognize a "bore" when you see one, and the clearer and richer does your "concept" grow.

Minor difficulties arise out of Prof. Smith's statement that a concept "is an embodied soul" with a "body" which "consists of sensible or imaginable matter." I have no wish to press these poetic metaphors, but I do not understand what they mean in prosaic science.

(3) When I came upon the absolute distinctions Prof. Smith seemed to draw between knowing and acting, and between altering what is and what is not "within us," as the *differentia* between knowing and acting, I thought at first there was nothing to do but to express dissent and to give references to my published works for the reasons. But when I came to Prof. Smith's third section I was gratified to find that he, himself, put, very forcibly, some of the objections to his distinction. I should not myself object so much to its dualism, as urge the obvious facts that every real judgment, whether it is dubbed "theoretic" or "practical," is a *decision*, and a (logical) *choice* between alternatives, and therefore an *act*. Conversely, I should be disposed to regard as mere prejudices the assumptions that the usefulness of a thought can have no bearing on its theoretic truth, and that the alterations which knowledge effects in us are not to count as alterations of the real. But perhaps it will suffice to make the merely logical point that though Prof. Smith has brought out what is generically common to knowing and doing, viz., that in both the self is altered, his *differentia*, that in the latter case there is a further alteration without us, hardly justifies any very absolute antithesis between knowing and doing. And, of course, with his later conclusion that "it is impossible to alter oneself without altering one's world, and equally impossible to do the converse," and that "the alteration will always be

at once and indissolubly a change from what is practically worse to what is practically better, and a change from ignorance to knowledge," I can have no possible quarrel.

(4) Nevertheless, I am not quite clear about what Prof. Smith means by "practical."

I gathered from his former paper (1) that "utility" was "a special kind of practicality," (2) that the "practical" is *not* "intellectual," but may nevertheless (3) "subserve the advance of the mind to Truth," (4) that both "scientific and infra-scientific thinking" are "practical," but that (5) there is also a sort of thinking which is not practical nor useful. It is exemplified in the "Categories," which are "pure or genuine concepts," spiritual essences or energies, spiritually discerned. They were diametrically opposed to the economic concepts, the account of which has no application to them, and is "not even an approach to the truth concerning them."

The present paper seems to differ only in holding that the "good" of a science is "not merely analogous to, but identical with, the 'good' of the ordinary economist," and "literally a commodity—or utility," though it is added that the ordinary economist knows that what has economic value may be internal and psychical. The "practical sphere" is also described as "that realm of experience where the mind's activity is engaged in altering what lies outside itself, and where, what it when successful produces, is not knowledge or truth but good."

I have some difficulty in fitting these dicta into any of the recognized meanings of "practical." (a) They do not fit into the traditional antithesis of "theory" and "practice," for that would regard scientific thought as "theoretic," and even as sometimes "purely theoretic," and not as practical and useful. Neither (b) do they fit into Bradley's conception of the practical; for Prof. Smith does not make alteration of existence the criterion of practicality. To him knowing also alters the mind that

knows. Nor (c) do they appear to fit into the wider pragmatic notion of practicality for which all truth must work and make itself useful, and all intellectual processes are practical, in so far as they presuppose acts and agents having purposes and ends which they judge to be "good."

(5) There remain the mystic "Categories," which appeal strongly to the psychical researcher within me. But they seem to resemble other "spooks" also in this that their "spiritual discernment" has to take place in the dark. I venture therefore to ask for a little more light. How does (1) the definition, and (2) the use, of a "Category" differ from that of a scientific concept? Prof. Smith's examples of Categories throw no light on this. For "unity," "existence," "causality" and "rationality" are predicated also in the sciences, and it seems imperative to know when they mean "concepts" and when "Categories." Moreover "Categories" can hardly be too ineffable to be defined, and the suggestion to this effect can hardly be intended seriously. A use at any rate they clearly have. It is not "vestigial" nor recessive, but manifest and dominant, and its name is edification.

(6) Lastly, I would ask Prof. Smith whether he is not mistaken on a question of scientific fact. He declares that "light does no work." But is he not overlooking that "light pressure" is an important fact in modern physics, which sets limits to the growth of stellar masses and accounts for that of comets' tails?

I am painfully aware that all these difficulties of mine probably prove nothing but my own obtuseness and my ignorance of Prof. Smith's philosophic terminology. But perhaps he has contributed to them a little by the character of his paper. It is so full of turns and surprises, of dialectical scintillations and oscillations, which enhance its brilliancy, but sometimes engender a preposterous suspicion that the whole may only be intended as an exquisite exercise in crural extension.

III.—*By* A. D. LINDSAY.

PROF. SMITH's paper is so interesting and stimulating that I am sure that we all wish to get as quickly as possible to the business of discussing or asking him questions about it. If we had known what it was going to be, we should, I hope, have given up the notion of a symposium and kept Prof. Smith's paper for the sole subject of discussion. I therefore must forbear resolutely from expounding any rival version of the Economic Theory of the Concept. I shall not even, however much I am tempted, take up seriously the questions involved in Prof. Smith's hymn to the Categories. I shall confine myself with asking a few questions in the hope that they will induce Prof. Smith further to elucidate his meaning.

But I cannot refrain from remarking on the curious spectacle of Dr. Schiller posing as a metaphysical absolutist. I had sometimes suspected while reading his discourses on logical subjects that that was what was the matter with him, but I had never expected such a frank confession. Prof. Smith confesses that he is tempted to desert his admirable distinction between thinking and acting, to believe that "it is impossible to alter oneself without altering what is not oneself but one's world, and the whole of one's world," but that though troubled by such thoughts he remains "round the portals of the Adytum of Absolutist Metaphysics." Dr. Schiller, of all men in the world, invites him to join him inside, to call his temptation a conclusion and go the whole monistic hog. He can have no possible quarrel with the "conclusion that it is impossible to alter oneself without altering one's world."

The point is important and I want, not to discuss it at any length, but to note what is involved. No one really believes that the structure of reality is that of an enormous, complex, but rigid machine, such that if you move one part of it, however small, all the rest will move along with it ; nor that, even when we think, we are clumsily taking part in a gigantic game of spillikins. Every time we act and every time we think we imply that we can change some things without changing others. Yet at the same time we know that the things we are changing and the things we are not changing are in the same world and are thereby related. It may be difficult to apprehend aright the relational nature of the world which is thus implied in our action and in our knowing, but any doctrine which would exclude such possibility of isolated change is surely condemned by the facts. But though this rigid conception of the universe is seldom formulated, and if formulated is usually rejected, its tacit acceptance is the cause of endless difficulties in philosophy. If we begin by believing in the reality of creative mind we seem forced by this doctrine to believe in nothing else : if we begin by believing in an external world we make ourselves only a part of the external mechanism. The object of which Wordsworth remarked that it " moveth all together, if it move at all " was a cloud, and it is not surprising that those who assume that they live in a world like that find themselves in a mist.

After this polemical digression let me put the chief question I want to address to Prof. Smith : What has happened as the result of his speculations to the ordinary world in which we all live—the world of people and animals, of birds and trees, and mountains and rivers ? He has presented us with two worlds, each hard to recognize—the dark mysterious world of concepts which are actions, and the to me more mysterious but to him illumined heaven of the categories—flooded with a radiance of pure light. Neither of these two mysterious worlds

when he is painting them in his most eloquent language can I recognize.

I think I can follow what he says about concepts when he calls them working models, when he says that they are made to serve a purpose beyond themselves, that they are therefore treated only as means. I should agree that because we treat them only as means we may call them economic. I should agree further that we do not seek to understand them for themselves, and that therefore they are never in themselves completely intelligible. But it seems to me absurd to say that these practical constructions or models are not used to help us to understand as well as to help us to shape other things to our services. A working model has no sense if you take it for itself, if you do not realize that it has been made to explain or to teach you to handle better that of which it is a model ; but it does help you to understand as well as to handle the latter. I think Prof. Smith would probably admit that the analysis of a piece of music which we often find in concert programmes is a concept in his sense of the term. It is something entirely different from the music of which it is an analysis, but it does nevertheless help us to hear and understand the music better. That is surely true of all our concepts. They help to make us understand as well as to handle other things. Surely the truth is that while thinking and acting are different, acting is continually serving thinking and thinking continually serving acting.

This, of course, is to assume that we know the world of history, the world where alone Prof. Smith at one time told us truth is to be found. But I am not sure whether he now thinks there is such a world and whether he would agree that we can in any sense know it. He seems in his paper to attach two different meanings to the word "know." In one meaning to know is said to be the same as to explain ; the other meaning is rather implied than definitely stated in what Prof. Smith says of the

categories. They are for him pre-eminently known, but I do not suppose he would think that they can be explained. Now the world of history is surely not known in either of these two ways; the good historian is as unwilling as the good scientist to say that he explains his subject, but he would hold that in virtue of his history he helps us to know it better, and on the other hand no one would maintain that the world of history is just known as apparently Prof. Smith thinks the categories are known, completely intelligible and luminous through and through. The objects of the world of history are surely more or less known; they largely elude us, are never completely understood by us, and yet they clearly are to some degree known. All the conceptual machinery of the historian is of the nature which Prof. Smith would ascribe to the concept, yet all that goes to make up the scientific part of history helps us to understand and know the world of history better. And if we go on and think of the relation of the working model not to a mysterious category but to the historical object, we must admit that the working model, the map, the formula, and so on, are so far intelligible, must have their rules and principles grasped, have got to be seen and so far understood. Clearly then models and concepts as Prof. Smith describes them have got something intelligible and comprehensible about them, however true it may be that because they are *σκευάστα*, because they are made to serve a purpose, there are as Plato said no *εἶδη* of them, and they are not fully intelligible in their own light.

I cannot therefore follow Prof. Smith either when he says that the concepts are entirely unintelligible, or when he says that they do not serve the purpose of knowledge, but I think he has raised a problem in regard to the use of concepts which may perhaps be put in this way, and in trying to state it I am following out a suggestion of Prof. Smith's :—

We can describe the map and the drawing and the working-model, etc., as aids to memory. We can say, as Bergson does, that we use concepts because our direct apprehension of reality is fragmentary and finite and inadequate to grasp all the flowing continuous world of history (that is always far greater than we can comprehend), but that by the aid of memory and all these shorthand devices which aid memory we can, so to speak, apprehend a larger section of the system. If we regard the concepts merely as aids to do this, merely instruments which enlarge our perceptual grasp, we might hesitate in saying that they aid knowledge. For merely apprehending a larger section of the world of history is not to know any of it better ; what we know we *conceive* in the etymological sense of the word. We apprehend more unity and system and coherence, and no mere enlargement of our vision will give us that, although without an enlargement of our vision we cannot get it. But when we ask how we come to comprehend the world of history better, to see it in its system and unity, we seem to be helped by being told what in it is significant, by getting certain keys or clues to this system, and I suppose these clues would be Prof. Smith's categories. I suppose you could make out a scale of what are ordinarily called concepts in the most general sense of the term, and have at the one end a scientific concept as Prof. Smith describes it and at the other end something like a category as he describes it, but all the clues and concepts which we ordinarily use seem to me to partake of both these aspects. The analysis of a piece of music on a concert programme helps us actually to hear more of the music, but it only does that because it sets out what is to some extent the significant structure of the piece, and surely the scientists' concepts always do that in some degree also. They at one and the same time may be described as helping us to know our way about the world, whether our purpose be when we go about it to know it or to handle it more efficiently, but they also only



help us to know our way about the world because they follow to some extent the world's real structure. The problem arises because it is not true to say that the more they help us to know our way about the world the more they can be taken to follow the world's real structure. Because they are instruments they have to be fitted to our hands, because they are instruments by which we to some extent come to know the world better they have to be based on apprehension and the nature of the real; but these two characteristics do not always coincide. Concepts seem to retain to the last their ambiguous position, and the extent to which they are shaped by the needs of action or by the nature of what they are to help us to know seems to vary quite indefinitely.

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## V.

FIFTH SESSION : *July 26th, at 2.30 p.m.*

*Chairman : MISS H. D. OAKELEY.*

SYMPOSIUM : PLATONIC PHILOSOPHY AND  
ARISTOTELIAN METAPHYSICS.

*By* MR. PAUL E. MORE, Professor W. D. ROSS *and*  
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I.—*By* PAUL E. MORE.

My thesis would be that there is a radical difference between the Platonic and the Aristotelian methods of dealing with the ultimate problems of philosophy, and that the prevalence of the Aristotelian method, since the fifth century A.D., has been detrimental to sound thinking. This difference of method I would denote by restricting the word "philosophy," so far as possible, to the Platonic procedure, and applying the word "metaphysics" to the Aristotelian, in so far as Aristotle goes beyond and differs from Plato in what he calls his first philosophy. I am aware, of course, of the somewhat arbitrary character of this verbal distinction, and in particular of the ambiguous meaning of the term "metaphysics."

To go back to early times, I have been struck by the fact that Gregory Nyssen in his great treatise *Contra Eunomium*, written to defend the orthodox creed against the extreme and logical outcome of Arianism, repeatedly charges his adversary with perverting the faith by the application to religion of the Aristotelian *τεχνολογία* or, as he once calls it, *ἡ ἀσέβεια ἡ Ἀριστοτέλους κακοτεχνία* (ed. Jaeger I, 38), whereas this and his other works are permeated with reminiscences of Plato. Nor is this attitude towards the two leaders of Hellenic thought peculiar to Gregory. You will find it in other protagonists of the Church through the fourth century, in whom Plato quite commonly stands as a forerunner of the orthodox faith, while Aristotle,

so far as he is remembered at all, is condemned as the prime heresiarch.

By the side of this fairly consistent attitude of the Greek Fathers may be set the curiously inconsistent position of Plotinus, whose work, like that of the Christians, is replete with echoes of and allusions to Plato, whom he evidently esteems as his master, whereas Aristotle is seldom named, and then chiefly as an author to be refuted. Yet at the same time—and in this Plotinus differs from the Christians—his system in the last analysis must be judged to have more affinity with the Aristotelian metaphysics than with Platonic philosophy.

Now presumably this contrast of attitude towards Plato and Aristotle respectively—though often it may have been more instinctive than reasoned out—signifies a radical difference in their manner of treating the important facts of our mental and spiritual life, and the clarification of that difference may throw some light on the later course of thought, secular as well as religious.

From a survey of the Greek Fathers I should say that what drew them to the philosophy of Plato was, in the first place, his clear perception of the Ideal world as a sphere of reality existing separately and independently, yet also, in some way inexplicable to reason, imposed upon, or involved in, the world of phenomena, and, in the second place, his belief in God as "the father and maker of the universe," of whose existence and will we have assured knowledge, yet whose nature transcends the scope of human intelligence. In other words, it was the combination in his philosophy of Idealism and super-rationalism, or, if you chose, irrationalism.

On the other hand, it was precisely the contrary position of Aristotle on these two points that repelled the orthodox theologians from him as either essentially irreligious or, if religious, the fountain of heresy. This divergence runs through the various

works of Aristotle, but, naturally, comes to a head in the *Metaphysics*. Mr. Ross in his recent exposition of Aristotle sums up the matter admirably (pp. 155 ff.). "Two main questions," he says, "occupy Aristotle's mind." One of these questions is "whether there are non-sensible as well as sensible substances, and if so, what they are. Are universals, as Plato claimed in his ideal theory, self-subsistent substantial entities . . . The polemic against the Platonic Forms, *i.e.*, against the substantiality of universals, is one of the leading notes of the *Metaphysics*, to which Aristotle returns again and again."

That of course is a commonplace of criticism ; but Mr. Ross, I think, following in the steps of his author, does not present the position of Plato quite adequately. He fails to discriminate the implicit but genuine and important difference in Plato's treatment of ethical principles and of intellectual *generalia*. And it might be added that what drove Aristotle to his repudiation of Ideas was apparently not the difficulty in itself of accepting the existence of an independent spiritual world, but the difficulty of finding any rational solution of the coincidence of such a realm with the realm of phenomena—a difficulty which Plato fully recognized at the end but, as it were, deliberately passed over.

The other main question that occupied Aristotle's mind is stated by Mr. Ross thus : "Is a single supreme science of metaphysics possible—a synoptic science which shall study the nature not of this or that reality but of the real as such, and deduce the detailed nature of the universe from some central principle ? . . . All that is, has a certain nature that belongs to it simply as being, and this can be known. . . In studying the primary kind of being, metaphysics studies being as such."

Now it is easy to see how the divergence of Plato and Aristotle towards *generalia*, or more specifically towards ethical Ideas, attached the Churchmen to the former as to a half-inspired

herald of the faith, and caused them to reject the latter as an insidious enemy of the very basis of all religion. It was to them simply the question whether there was such a thing as an immaterial world of reality, a spiritual realm wherein the emancipated soul could prolong its personal existence after death in communion with God. Plato left the door open to faith; Aristotle, with his doctrine of individual things composed of form and matter as the only substantial realities, definitely precluded such a hope. Perhaps those who have not read widely in the Greek Fathers are unaware of the thoroughness with which Plato's conception of the realm of νοητά was assimilated by the more enlightened of the churchmen with their belief in the βασιλεία τῶν οὐρανῶν. I have said something about this in my *Christ of the New Testament*, but the matter is worthy of expansion. Here I can only allude to the testimony of such a passage as vi, 74 (Jaeger II, 200), in Gregory's *Contra Eunomium*.

The other point—in which Aristotle stood rather as the father of heresy than as the antagonist of religion, so far as such a distinction would be recognized by the orthodox theologian—needs perhaps some elucidation. It might seem at first blush as though the Aristotelian Idealism in the cognizability of ultimate being would be grasped by the Christian as a confirmation of theism, but it is in fact *exactly* *opposite* to this very thesis that Gregory directs the main lines of his argument. The universe for him is divided primarily into two realms, the αἰσθητόν and the νοητόν (I, 100), and of these the νοητόν, though known to us by spiritual perception and forming the field of our faith and hope, cannot be expressed in terms of time and space, which belong to the realm of αἰσθητά, and cannot be comprehended by ἡ καταληπτική τοῦ νοῦ δύναμις; any attempt so to comprehend spiritual realities must result in reducing them to the grade of the sensible world. Going a step further, he insists on the fact that God as ultimate being, if such a phrase has any

meaning, which he questions, is utterly unknowable. To the taunt of Eunomius (II, 35) that, if this be so, then the Christian is constrained to worship that of which he is ignorant, Gregory replies that we do indeed know that God is, which is a different thing from pretending to know what He is or to define pure being. For religion it is sufficient to perceive His operation in the world and in the heart of man (I, 379, 384). The discussion of being, such as Eunomius introduces into religion from the *τεχνολογία* of Aristotle, dries up the very springs of that sense of mystery and awe on which worship depends (II, 239 ff.). He does not add, as, following Athanasius, he might well have done, that the Nicene use of *homousion* was in no sense a definition of being, but was a warning and defence against any attempt to draw metaphysical distinctions and grades in the nature of the divine. Further, and this is the heart of his contention, Gregory shows that all the rational difficulties in regard to the nature of Christ flow from this conception of God as absolute and cognizable being; the Aristotelian metaphysic, if brought into theology, ends inevitably on the one side in a Sabellian form of pantheism or <sup>in</sup> ~~in~~ <sup>man</sup> transcendence, or on the other side with the Arian school. Eunomius in a rationalizing division of *τὸ θεῖον* into meaningless grades. Religion has to do not with implications of absolute being denoted by *ἀγεννησία* and *γέννησις*, but with distinction in personality denoted by father and son.

I fear the discussion as it comes to us in the terminology of these old theologians will sound very remote to modern ears, but I think it indicates a divergence between Plato and his great pupil which lies far below the surface and which has played a dominant rôle in subsequent history. However they may agree in many of their tenets, however much Aristotle may have carried over from his teacher, at the last they part company on these really fundamental matters, the independent and

irrational reality of the Ideal world as held by Plato, and the rational cognizability of absolute being as held by Aristotle. I know that even here they were not perfectly consistent—what philosopher is?—that Plato, for instance, sought desperately to find a rational solution of the relation of phenomena and Ideas in terms of “participation” or what not; but in the end, if I read the *Parmenides* aright, he admitted the impracticability of such attempts. His last word on the subject, as I take it, is simply the sentence put into the mouth of Parmenides, that we must believe in the existence of Ideas without comprehending them; otherwise there is no philosophy, and indeed no conversation. So also his discussion of being and not-being in the *Sophist* undoubtedly prepared the way for Aristotle’s metaphysical thesis and categories; but, again, the conception of absolute being as the transcendental reality, deprived of spiritual and personal qualities, was never formulated by Plato, and could not be formulated by him consistently with his philosophical principles. Against the vacant conception of God as the unmoved mover and as the activity of contemplation that contemplates nothing—reached by Aristotle in the *Ethics* and *Metaphysics*, we have to set Plato’s thesis of a creative personality in the *Timæus*, and to recall his warm exclamation in the *Sophist* (248 E): “In the name of God, what is this! Are we going to believe out of hand that the highest Being has in fact no motion or life or soul or intelligence—a thing that neither lives nor thinks, but remains for ever fixed in solemn, holy, unconscious vacuity?” In his old age as in his prime, in the *Laws* as in the *Phædrus*, Plato showed that the only way of bringing home to consciousness, so to speak, the reality of the non-sensible world was through what may be called the ethical imagination. It was for this power as a religious poet, one might say, that he was cherished by the Fathers as the supreme example of the *anima naturaliter christiana*.

The mixed attitude of Plotinus towards the two schools is attributable to the same causes. He was Platonic in so far as he clung resolutely to his intuition of an Ideal world; he was Aristotelian in so far as he sought for ultimate reality in absolute being, or in an abstract Unity beyond being. The chief difficulty in understanding the *Enneads* arises, I think, from the mechanical mixture in them of two incompatible modes of thought, of philosophy and metaphysics as one may define those terms. And it may be added that St. Augustine, by his entrance into Christianity through Neoplatonism, grafted this "conflation," or confusion, so deeply into the body of Western theology that from his day it has never been eliminated.

What may be more important for us, a careful analysis of the incompatible elements in the *Enneads* will show that the attitude of the theologians and Plotinus towards Plato and Aristotle, though attributable primarily to the conclusions as to God and the other world, goes back to a radical difference of method in the two schools, in particular to a variance in regard to the function and authority of reason.

I have said that Plato turned to the imagination and emotions to realize certain truths which transcended, or eluded, the reason. It would be more correct to say that in the Platonic method the beginning of philosophy, the material upon which reason is to work, is given by the emotions and the imagination, whereas with Aristotle the first intuitive truths are themselves the data of pure reason. For instance, one of the starting points for the Platonic philosophy is the perception of traits of physical beauty and moral order in a world marred by change and ugliness and turpitude. Certain emotions are stirred by this perception, and the imagination (no doubt with the aid of reason, for the question is rather, perhaps, of emphasis than of complete disjunction of the faculties) is roused to conceive what such beauty and goodness might be if severed from all imperfection and



contamination. Reason then steps in to explain how the presence in the soul of these images of supernal beauty and goodness may be evoked from, but are not really created by, the perception of fair and ordered phenomena, and must be a kind of reminiscence, or awakening, of what belongs to the soul by virtue of its contact with another world. The function of reason is thus to deal with the data of experience, to explain and justify them if it can, to interpret and develop and combine and analyse and apply. But always in this process reason is in a way secondary, and must submit to the law which declares: thou mayst deal with the facts as thou wilt, only thou shalt not deny them; thou shalt be the servant not the mistress of the soul.

With Aristotle, on the contrary, the starting point is avowedly in truths given by the intuitive reason in the form of logical axioms such as the law of excluded middle and, more especially the law of contradiction: "The same attribute cannot belong and not belong to the same thing at the same time and in the same respect." And this axiom, as Mr. Ross rightly observes, is stated quite objectively as a law of being. It is, you will observe, at least the law of reason, for reason, as Aristotle himself rightly defines it (*Metaph.* 1051<sup>b</sup>3, *De Anima* 434<sup>a</sup>9) is the faculty that connects concepts as being one or severs them as being unlike. And in this process of combining and separating it is the law of contradiction that really governs our thought. As such, reason, if restrained to deal with the facts of experience as they are presented to it, is of the utmost value, is the true guide of life. But now suppose that, instead of suffering such restraint, this faculty is taken "objectively as the law of being"; what will be the result? Suppose that our experience of life goes back to a contradiction behind which, however restive we may be under the truth we cannot reach? So certainly Plato saw the world. To him life was a paradox of good and evil, the one and the many, the material and the spiritual, which cannot be reconciled one

with the other, yet exist together in the same subject at the same time. The foundation of his philosophy is thus irrational, however rational the superstructure may be. The metaphysic of Aristotle is just the reverse: the foundation is rational, the superstructure is irrational. Good and evil, as contradictions, cannot exist together, and therefore he must deny the existence of any principle of evil in the world; evil becomes a mere "by-product of the world process, something that casually emerges in the course of the endeavour of individual things to reach such perfection as is open to them." Again the one and the many, the spiritual and the material, as contradictories cannot exist together. Hence the reality, the substance, for Aristotle is the individual thing, whose individuality depends upon matter. That is the effect of the distinguishing process of reason acting under the law of contradiction. The Ideal world of Plato is eliminated, and in its place reason as the positive law of being sets up a conception of an absolute Being and abstract Unity which has no relation in itself to individual substances. That is the effect of the combining process of reason acting under the law of contradiction.

I am aware that Aristotle is not perfectly consistent in following this process. His conception of species is a relic of Idealism, and his division of the universe into individual substances and absolute Being is softened by the upreaching of the individual towards the absolute, however he may endeavour to keep the two realms apart. Life and the facts of life were too much for him in the end. But essentially his method is the opposite of Plato's, and one is justified, I contend, in applying to it the term "metaphysics" and in restricting the term "philosophy" to the Platonic method.

Space is not left me to follow the influence of these divergent methods through the long history of thought. For the middle ages I can only point to that solid work, the Bampton Lectures

of R. D. Hampden, which raised such a tempest in Oxford at the time of their delivery, only to sink into oblivion. With great acumen Hampden shows the mischief wrought by the sway of Aristotelian rationalism. In modern times one sees the rationalism of Aristotle carried on in the division of our schools into those who would limit reality to an impossibly absolute Idealism of the One and those extreme Pragmatists who would reduce all of life to flux and change.

In either case the conclusions are reached by forcing the paradoxical and irreconcilable facts of life into conformity with the combining or severing function of reason under the law of contradiction. It would follow also that much of our current discussion of time and space and God, most of our epistemology and much of our monistic psychology, are equally efforts to deal with the absolute being of things through the faculty of reason. It is a question whether our professional metaphysics of the schoolroom is not in large measure an "expense of spirit in a waste of words," and whether the student who desires to become a philosopher in the true sense of the term might not give more heed to the great poets and creators of human life, and ought not above all to be instructed more carefully to distinguish between reasoning from the irrational facts of experience and looking for an ultimate consistency in reason.

## II.—By W. D. Ross.

I MUST begin by admitting some uncertainty about the meanings which Mr. More assigns to philosophy and to metaphysics respectively. This much is clear, that philosophy is a mode of thought which he likes and metaphysics one which he does not like; but this is certainly not all that he means by the words, and Aristotle is not simply to him a Doctor Fell. There must be reasons for the like and the dislike; yet they are not very definitely stated. Two features of Plato's philosophy are said to have drawn the Greek fathers to the study of it: (1) "his clear perception of the Ideal world as a sphere of reality existing separately and independently, yet also, in some way inexplicable to reason, imposed upon, or involved in, the world of phenomena," and (2) "his belief in God as the father and maker of the universe, of whose existence and will we have assured knowledge, yet whose nature transcends the scope of human intelligence. In other words, it was the combination in his philosophy of Idealism and super-rationalism, or, if you choose, irrationalism." These two points are connected by Mr. More with, and were perhaps suggested to him by, the two questions I had mentioned as mainly occupying Aristotle's mind when he formulates the programme of the *Metaphysics*—(1) the existence of non-sensible substances, and (2) the possibility of a science of being as such. Now in the difference which exists between Plato and Aristotle on the first point I can see nothing which makes it proper to call Plato's way of thinking philosophy and Aristotle's metaphysics, unless it be the element of super-rationalism or irrationalism which Mr. More detects in Plato; and this seems to be also the point which for him is important as regards the second question. Shall

I be right, then, in supposing that by metaphysics he means a mode of thought that relies on the competence of reason to understand the world, and by philosophy one that is content to make assertions without justifying them at the bar of reason? If this be so, I doubt whether Plato would have thanked him for his advocacy. Plato is sometimes content to express ignorance on a particular point; but he never (I think) glories in his ignorance or attempts to extol any other faculty at the expense of reason. That would have been what he calls *misology*, and would have deemed very much the worst of philosophical offences.

But I must turn to consider the two questions separately. I will begin with the question of the separate existence of Ideas. I must confess that I cannot regard this as being of such serious import as Aristotle would have us believe. The question really at issue between himself and Plato can be narrowed down to comparatively small dimensions. To begin with, I think there can be little doubt that the main meaning of the theory of Ideas is the assertion of the existence of universals as something *distinct* from individual things. To put the matter otherwise, it is the assertion that similarity is not an unanalysable fact but is always identity in difference. With this goes the assertion that the mind is capable of detecting the elements of identity between different things, and that these are the objects of all thinking (as distinct from perception), and in particular of science. Further, there is the assertion (necessarily bound up with what goes before) that universals are as objective as the individuals in which they are involved. With all this Aristotle is in absolute agreement. He is in no sense a conceptualist, but a realist (in the old sense of the word) pure and simple. Again, when Plato asserts the separateness of the Ideas, it is quite certain that he does not mean spatial separateness; the Ideas are nowhere. What, then, does "separateness" mean, if it is to mean something more than difference, and yet not to mean spatial separation? It may

mean temporal separation, *i.e.*, that an Idea exists when no individual instance of it exists, as well as when instances do exist. Plato certainly asserts that forms are eternal. But so does Aristotle. It may mean logical independence, *i.e.*, that there are Ideas which are not, have never been, and never will be exemplified in individual instances. Yet I cannot find that Plato ever asserts this. I am more than half inclined to think that in his language about the separateness of the Ideas Plato is simply putting in a very emphatic way his sense of the difference between a nature and the things that bear that nature, and of the corresponding difference between thought and sensation. But if so, he was ill-advised in using such expressions as "separate," which do not really express his essential meaning, while Aristotle in his turn errs by pressing hard on these ill-chosen terms as if they expressed what Plato at bottom meant. It is, I think, only so long as we do not stop to ask what "separate" in this connexion means, that we shall think the controversy a very vital one.

The point that specially appeals to Aristotle, as he surveys the world, is that no universal is ever operative except as an element in individual things. It is, for example, not mind but minds, or (if we prefer it) mind as present in individual minds, that is active in the world. And surely his doctrine of the immanence of the universal is one that for a real understanding of the universe we can never afford to forget. It is, surely, the plain truth, that individual substances lie at the bottom of everything that happens, that every physical event presupposes a body and every spiritual activity a mind. But a difficulty arises, which Aristotle does not seem entirely to have appreciated. It is, that a universal can be made an object of *thought* when no particular instance of it is in existence. (This fact was obscured from Aristotle by his faith in the unfailling succession of the generations. There could never fail to be in existence particular men, horses, etc., and he therefore felt no difficulty in insisting

on the eternity of the form or species. But for us the adoption of the evolutionary way of thinking, and the recognition of the fact of obsolete species, has changed all that. The mastodon can be studied now, when no individual mastodon exists. And what we study is clearly not nothing. Must we not, then, assert some being for the Idea of mastodon, apart from individual mastodons?

The same difficulty presents itself in another way, in connexion with those Platonic Ideas which seem to be rather ideals towards which individuals approximate than universals which qualify individuals. This, I imagine, is what Mr. More means by the difference between "intellectual *generalia*" and "ethical principles." But I would remind him that the "ideals" are not confined to conduct. Beauty, oneness, equality are similarly described by Plato. It is well known that Plato has two very different ways of expressing the relation between particulars and Ideas—"participation" and "resemblance." The conjecture may be hazarded that the latter expression is suggested by the case of those Ideas which are naturally thought of as ideals transcending all individual things, and the former by the Ideas that are naturally thought of as general characters exhibited in particular instances, in cases where the imperfection of these does not obtrude itself to our notice. In treating the Ideas as simply the equivalent of their own universals, Aristotle is certainly overlooking that side of the Platonic Idea which is expressed by the word "ideal."

Now as regards the Mathematical Ideas such as oneness or straightness it does not seem necessary to think of the Idea as transcendent. If there is any individual thing in the world which is strictly one, definitely one and not more than one thing of a particular kind, there we have enough individual basis for the Idea of oneness, and need not believe in a transcendent Idea of oneness. And I would suggest that each human mind supplies

us with an instance of the type we require ; it is definitely one and not more than one mind. And again, though we should have difficulty in saying of any ordinary sensible body that it is one and not more than one, each atom and each electron is definitely one and not more than one atom or electron. That each atom contains many electrons and is thus many as well as one, seems no real difficulty ; the point is that since it is definitely one atom, we need not regard unity as an ideal to which individual things only approximate, but as a universal which has particular instances though other particular things may only approximate to being instances of it. So, too, with straightness. Sensible lines only approximate to straightness, but since geometrical points form a continuum such that between any two there are always others, there must be geometrical lines which actually are straight.

We may now turn to beauty and ask whether this has to be thought of as a transcendent ideal, or as an immanent character present in individual things. It seems clear that by far the greater part of our thought about beauty is about a characteristic which we recognise as present in particular things, particular natural objects or scenes, particular poems or pictures or musical compositions. Our thought of beauty seems to be arrived at by noticing that there is a great variety of objects that produce in us a generically identical though specifically different experience ; by beauty we seem to mean either their common power of producing this experience, or some hitherto undefined characteristic or characteristics in virtue of which they have this power. So far, beauty seems to be simply immanent in particulars. But, it may be urged, is not the artist led on by the thought of a beauty not manifested in particulars but transcending them all, of which they are mere "imitations" ? I venture to think not ; to think that this is rather a philosopher's theory than that which artists would give of their own procedure ; that they are guided



rather by the thought of some new embodiment of that same quality which already has many familiar embodiments. And even this seems to be true only of the more self-conscious and sophisticated type of artist. Many of the greatest poets, it would seem, have been stimulated not by the desire to create beauty but by the desire to tell a story or to express a mood ; beauty has not been the guiding ideal but a by-product that has emerged in the carrying out of a humbler wish.

When we turn to conduct, we seem to find something much more like a transcendent ideal. The thought of duty is essentially the thought of a *faciendum*, to which the question whether the *faciendum* is anywhere *factum* is irrelevant. It seems that our thought of justice may well not be formed by generalisation from just acts already done but may be called into being by the observation of existing injustice. A man might think all existing social relations to be unjust, and be fired to action by the thought of bringing into being something that exists nowhere already. And if this be so, we have found, in our power of thinking of species of which no instances exist any longer, and of types of conduct of which no instances exist as yet, two examples of transcendent Ideas. Whether we should say that such universals subsist, thus ascribing to them some mode of being other than existence, or whether we should simply say that they are possible objects of thought, I am not sure. Yet it would seem that it must be a philosophical mistake to ascribe separate being to a nature apart from anything that has that nature. We have, if my argument is right, established the existence of certain transcendent Ideas as what would usually be called objects of thought. But to call them objects of thought is to assign objective being to them. It would perhaps be better to say that in naming them we are describing the particular nature of certain of our acts of mind, and not of objects at all. But anyhow we have detected a fact which seems to have escaped Aristotle, and to which

Plato's language seems to do more justice. Yet I should still say that Aristotle is right in the main point in insisting on the correlativity of the universal and the particular, *i.e.*, on the necessary union of essence and existence.

I would challenge, further, Mr. More's description of Plato's world of Ideas as a spiritual world. This world, it must be maintained, is a neutral world, peopled not only by ethical and æsthetic ideas but by such ideas as equality, straightness, roundness, which are correlative not to minds but to bodies. It is a cold realm of nature divorced from existence, not a world of minds or spirits at all. It is only (I venture to say) by a confusion of thought that such a world can be identified with the society of individual spirits in communion with each other and with the infinite individual spirit, which has formed the actual Christian idea of the future life. It is true that in the *Sophist* Plato ascribes to the truest reality life and reason and movement. But that amounts, I suggest, to an abandonment, permanent or temporary, of the ideal theory ; to saying that the highest reality is not a world of abstractions, of natures in distinction from things having them, but is an individual spirit or a society of individual spirits. Plato seems, in fact, to oscillate between the two ways of thinking ; sometimes he speaks of the Ideas and sometimes of God as the supreme reality, but he never seems to bring the two into any clearly thought out relation. As against this, we cannot wonder that the Catholic church ultimately accepted as its master in philosophy Aristotle, who at least thinks of the highest reality definitely as an individual mind. No doubt his conception of God as a being entirely absorbed in self-contemplation, and turning his back, as it were, on the world, is alien to religious feeling. But his theology presents at least one definite and important point of contact with Christianity.

Before leaving the Ideas, I must finally ask whether there is

rightly said to be an element of irrationalism in Plato's attitude towards them. Mr. More holds that Plato's last word on the subject is an admission of the impracticability of all attempts to state the relation of phenomena to Ideas, coupled with the assertion "that we must believe in the existence of Ideas without comprehending them." But Plato hardly goes so far as this. What Parmenides says is that the question is a very baffling one. But he is not content to leave that matter at that, and to believe that what is true can really be incomprehensible. He suggests that it is Socrates's philosophical inexperience that makes him impotent before the difficulties of the problem; and that the cure is not to abandon reason for some vague intuition, but to go through a severe course of preliminary philosophical reasoning, which the second part of this dialogue is meant to illustrate. Plato is always honest enough to confess that he is for the moment baffled, but he never (I think) despairs of the power of reason to understand reality.

It is, however, more in connexion with the second main question that Plato is described as admitting an element of irrationalism, and Aristotle as being ultra-rationalistic. Aristotle's offence, I gather, is that he attempts by the use of reason to discover the nature of being as such. In doing so he is using a different method from Plato's, and it is this that is metaphysics in distinction from philosophy. The contention seems to me highly paradoxical.

Is it not Plato who insists that there is an Idea of good which is in principle capable of being grasped by reason, and which in proportion as we grasp it will elucidate for us the whole nature of the world and of everything in it? And is it not Aristotle on the other hand who insists that each science must start with particular principles which are not demonstrable but must be borrowed from experience? Mr. More holds that for Plato the function of reason is "to deal with the data of experience, to

explain and justify them if it can, to interpret and develop and combine and analyse and apply. But always in this process reason is in a way secondary, and must submit to the law which declares : thou mayst deal with the facts as thou wilt, only thou shalt not deny them ; thou shalt be the servant not the mistress of the soul." I should like to maintain that this account is on the whole more true of Aristotle than of Plato. It is to Aristotle that we owe the account of the gradual development of science and philosophy from the humbler faculties of sense, memory, and imagination. It is he who says " we cannot think without images." It is he who insists over and over again in his physical works that experience must be the starting-point of theory, that theories must be framed to suit the facts, and not facts distorted to fit our theories. It is he who insists that each science, instead of trying to deduce conclusions from some central insight into an " Idea of good," must start with intuitive perceptions of truth within each particular system. Arithmetic must simply take it from experience that there are units ; geometry must take it from experience that there are spatial magnitudes. Ethics must start with the unreasoned conviction of the plain man that there are such things as good and bad, as just and unjust. The theory of poetry must start with the facts that we delight in imitating and in seeing imitations, and in imitations of fine rather than of ignoble characters. Mr. More seeks to attach an extreme importance, in Aristotle's view, to the principles of contradiction and of excluded middle. No doubt Aristotle emphasized these, as Plato had done before him. They are principles which we must never forget. Any view that conflicts with them must at once be rejected. Any one who denies them is precluded from all intelligent intercourse with his fellows, and from all coherent thought on his own account. They are laws of being as well as laws of thought ; and indeed to suppose that they could be the latter without being the former would be to

treat our thought simply as a play of ideas to which the nature of reality need not answer, and to sink into a complete scepticism. With all this Plato would have cordially agreed. But if it is suggested that Aristotle makes more of these principles than I have indicated, that is a travesty of his thought. So far is he from holding that the detailed nature of the world can be deduced from these principles, that he tells us expressly that they do not even occur among the premisses of science. They are the underlying principles, apart from which we should never see any conclusion to follow from any premisses ; but the premisses of our thought are always principles of smaller generality borrowed from some particular region of experience.

What then, it may be asked, comes of Aristotle's attempt to study the nature of being as such ? It is not, we must realize, an attempt to deduce the nature of everything in the universe by abstract reasoning. It is an attempt, by reflection on the nature of all that we experience, to discover what *at least* must be the character of everything that is, while recognizing that the individual things in the world have many further characteristics that cannot be arrived at by any such reflection. With this general reflection Aristotle cannot be said to get very far. The *Metaphysics* is far more a series of attempts to attack and restate the problem than a successful solution of it, or even one which its author thinks successful. He arrives at little more than the discovery that everything that is must at least have an essence, a nature which can be stated in a definition, irrespective of its embodiment in a particular matter which cannot be stated in definition. His attempt to study being as such, or the general nature of being, is complicated by his adoption at times of a different problem, that of the nature of the highest or purest being, viz., pure form as it is found in God, in the intelligences that move the spheres, and in the human reason. He attempts indeed to connect the two problems by saying that the highest being will be "universal

just because it is first," so that in coming to know its nature we shall *ipso facto* be coming to know the nature of being in general. But this suggestion is never worked out into detail. He gives us in his account of God his view of the nature of the highest being. But he never says how much of this nature is shared by other things as well. Perhaps the only conclusion which the investigation in Book Z warrants is that the element of form, which constitutes the whole nature of the highest being, must be present in all things. This is a very exiguous result of the inquiry into the nature of being as such. Its slenderness is on the one hand a reproach to Aristotle. The inquiry into the nature of being as such, which is proposed as the subject of metaphysics, comes to very little as regards the main issue, whatever be the interest and value of the discoveries incidentally made. But this very failure seems to vindicate him against the charge brought against him by Mr. More. It is hard to see how a result so abstract as this can be in any way hostile to religion.

The bearing of the thought of Plato and Aristotle on religion, which is (I think) Mr. More's main subject, turns in the main on the two questions of God and immortality. With regard to God there can be no doubt that Plato uses language which is much more like the language of theism than any used by Aristotle. God seeks to make everything as good as it can be made ; he is the author of good and not of evil ; he exercises a providential care over his creatures ; he rewards good and punishes evil. With this must be compared Aristotle's God, whose only object of contemplation is himself. On the other hand, in reading Plato we have an ever-present doubt as to the relation between God and the Ideas. Many of the best scholars are convinced that for Plato God is identical with the Idea of good. But if so, either Plato is not serious with his notion of Ideas as natures divorced from individual existence, or he is not serious with his theistic language. Other students are equally certain that

God is for Plato distinct from the Idea of good. But then very serious difficulties arise as to the relation between the two, difficulties on which Plato throws no clear light. Aristotle, on the other hand, seems to make the supreme reality explicitly an individual mind. And secondly, Aristotle makes a far more sustained attempt to *prove* the existence of God. These are, I think, the reasons which have on the whole made the later Christian theology look rather to Aristotle than to Plato ; but no doubt religion itself finds the impassioned language of Plato much more congenial than the cold scientific argument of Aristotle, and no doubt Plato's temper was much more religious than that of his disciple.

With regard to immortality, it seems to me clear that Plato's views have much more affinity with those of Christianity than have Aristotle's. He works with what may roughly be called a two-substance doctrine, in which the soul is thought of as a reality temporarily wedded to a body but in principle independent of it. In this partnership soul is the predominant partner and is naturally thought of as capable of surviving the body's death. With Aristotle the soul is the plan of organization of a living body, and to expect that it could exist without a body (or even in combination with a different body) is quite out of the question. He is therefore led to restrict immortality to the reason, which, by a relic of Platonic thinking hard to combine with the rest of his view, he holds to be independent of the body. The resurrection of the body is incompatible equally with Platonic and with Aristotelian views ; but it is (I suppose) only in some highly sublimated form, as meaning the survival of the whole personality, that modern religious thought can hold to this doctrine, and in that form it naturally looks to Plato and not to Aristotle as its friend.

I should be sorry to put myself forward as a champion of Aristotle against Plato. In the main I accept Prof. Wallace's *obiter dictum* : "Depend upon it ; whatever Plato or Aristotle

may say, nine times out of ten they mean the same thing." And where they do not, the advantage is by no means always with Aristotle. But I cannot agree entirely either with Mr. More's reasons for admiring Plato, or with his reasons for belittling Aristotle.





## III.—By G. DAWES HICKS.

WHEN I ventured to suggest that the relation of the Aristotelian to the Platonic philosophy would be a suitable theme for a symposium, I had in mind Prof. Werner Jaeger's brilliant work on Aristotle, published two years ago. Not only has Jaeger propounded a theory of the phases of development through which Aristotle's thought passed in the course of his mental history, but he has presented such an imposing mass of evidence in support of his view that no student of Aristotle can afford to neglect it. The theory itself is in no sense a revolutionary one; it is that Aristotle began as a whole-hearted disciple of Plato, that he then went through a transition period in which, when discarding the doctrine of supersensible entities, he still endeavoured to retain the other cardinal tenets of Platonic doctrine, until finally he broke away entirely from the Platonic school and worked out *inter alia* his own peculiar doctrine of *οὐσία*. It is, as Prof. Taylor has observed, probably the case that in our reading of Aristotle we have all felt his personal history must have been somewhat on these lines, but never before has so sustained an attempt been made to prove, by a minute examination of the Aristotelian writings, that it was so. A discussion of some of Jaeger's contentions would have been both opportune and valuable, and I regret, therefore, that we have been led off upon another track. My regret is accentuated by the fact that I am not at all sure what it is we are supposed to be discussing, for I can scarcely imagine that it is thought much light can come from considering whether the term "philosophy" is more properly applied to the Platonic or to the Aristotelian system. However, I will endeavour, as far as possible, to fall into line with the two pre-

ceding writers, and not attempt to start other problems in which, I confess, I am much more interested.

In the main, I find myself in agreement with what Prof. Ross has said. The dictum of William Wallace's, which Dr. Ross quotes at the end of his paper, seems to me essentially sound, and to express what almost every student comes more and more to feel as he penetrates into the details of the Aristotelian system. It is true that in approaching the latter from the point of view of Platonism, the first impression one gets is that of irreconcilable opposition. Aristotle unfolds some of his most characteristic views largely through hostile criticism of Platonic doctrine. He is never weary of resisting what he takes to have been the absolute separation instituted by Plato between the world of generation and the world of true being,—a separation that seemed to him to cut at the roots of any explanation of the former by the latter. As represented by Plato, the Ideas do not, he argued, explain either how we come to know things or how things come to be. And his criticism of special Platonic doctrines was animated by the same kind of opposition. He will have a human good and not an absolute good. The state which he depicts is not an ideal state, but the state that is best adapted to concrete human nature. Yet, notwithstanding this difference in detail, there is, it seems to me, fundamental agreement in general spirit and in final result. For Aristotle, as for Plato, ultimate explanation consisted in connecting the world of generation, or of relative being, with the world of absolute existence. Aristotle fully recognized, as Plato had done, that the world of generation as a whole stands in need of a principle which lies outside itself, and that the necessity for such a principle becomes manifest when we follow out the general lines of explanation to be discovered within the world of generation. But his contention was that nothing is gained by first placing over against the world of generation a duplication of its main features which, as distinct *in kind*, can

furnish no explanation of what is *in* the world of generation. And what he desiderated was that the structure of the world of generation should be worked out in detail,—a world which had its own rights and independent value, and from the consideration of which investigation must start. His method, as contrasted with the Platonic method; may, therefore, be called empirical, although it would be altogether misleading to describe his final philosophical conclusions as empirical.

I share to the full Mr. More's enthusiastic admiration of Plato; indeed, it would be difficult to find a student of philosophy who in his heart of hearts does not. For, after our own devious wanderings in the fields of speculative thought, most of us come back to Plato in the end, although I doubt whether we should do so if we took Platonism to be exactly of the character which Mr. More has drawn for us. Yet I fail to see why enthusiasm for Plato should in any way detract from our appreciation of Aristotle. Mr. More would constitute a radical difference of method in dealing with the ultimate problems of philosophy on the part of Plato and Aristotle, while, so far as I can see, when they come to ultimate problems, their methods are essentially similar. I am puzzled, as Prof. Ross is, by the distinction we are invited to make between "philosophy" and "metaphysics," even though I happen to have read the books of Mr. More in which that distinction is expounded and enforced. Philosophy, we are told, is "the sincere and humble endeavour to make clear and precise to ourselves the fundamental facts of our conscious life"; both "its method and its truth" being "summed up in the three Socratic theses—scepticism, spiritual affirmation, and the paradoxical identification of virtue and knowledge." The curious feature about this definition is that, while the first half of it is at the best descriptive only of a comparatively small part of Plato's achievement, it is so qualified in the latter half as apparently to be applicable to Socrates and Plato alone (and

possibly those who, in Mr. More's opinion, are genuine Platonists). Metaphysics, on the other hand, is said to differ from philosophy in this, "that it essays to give a consistent explanation of the *rerum natura*, including our consciousness, in terms of pure reason, thereby playing false to the law of scepticism, and affecting a rational reconciliation of the Socratic dualism." The curious feature about this definition is that, while it is intended apparently to apply to all systems of thought, ancient and modern, other than Plato's, yet, with the doubtful exception of Hegel's, it really applies to none, for of no one of them, surely, is it true to say that it has attempted to explain in terms of the *reine Vernunft* alone the reality of things. Seeing, however, that Aristotle is thus to be placed in the great company of Heracleitus, Parmenides, Plotinus, Spinoza, Leibniz and Kant, while Plato is to be separated from it, it would look, after all, as though, in this division of the sheep and the goats, Aristotle occupies a position which Socrates and Plato, in their lonely isolation, might well envy. And I do not know that the identification of "metaphysics" with "eristic" in any way alters the situation. For eristic, so understood (the attempt, namely, of reason "by its own native force to build up a theoretic world of abstract unity excluding multiplicity or of abstract multiplicity excluding unity"), whatever it is, is obviously something very different from that mode of arguing for argument's sake which Plato found exemplified in the procedure of certain of the Sophists and with which he contrasted his own "dialectic."

So far as Mr. More resists the effort to see in Platonism a sort of anticipation of the Hegelian idealism, I am entirely in accord with him, although it seems to me no less important to resist a similar tendency as respects Aristotelianism. But, because the Ideas were not conceived by Plato as thoughts in the infinite Mind, it by no means follows that he conceived of them as irrational realities or as realities that are not cognizable by means of reason.

Quite the contrary view is, if I mistake not, that which is consistently maintained in the Dialogues.

Mr. More holds, so I gather, that the Ideas, according to Plato's way of regarding them, fall under two quite distinct categories which may be designated as the intellectual and the ethical respectively. Under the former head were included not only mathematical forms but those universals which correspond to the class notions of things in nature and to the class notions of manufactured articles. Under the latter head were included those universals which assume the aspect of Ideals—Justice, Goodness, Beauty—and which were the "Ideas" for which Plato was chiefly interested to claim existence. It is admitted that so far as the former type of "Ideas" is concerned, Plato taught that our knowledge of them is attained through the exercise of the rational faculty; that we come to recognition of them through a process of generalizing, from perceiving the similarity manifested in a group of objects or from observing quantitative relations. But, it is contended, Plato's treatment of "ethical Ideas," the insistence upon which constitutes the essence of what the world has rightly known as Platonism, was totally different. Plato represented them as "the unchanging reality behind moral forces"—a conception which is "a natural development of the Socratic affirmation of spiritual truth." And he did not suppose that we become acquainted with these "ethical Ideas" through the operation of the rational faculty; the moment, in fact, one undertakes to describe them in intellectual terms they fade into nothingness. They were, in truth, taken by Plato to be products of the imagination, projected, like the creations of the artist, outside the soul, so as to wear the aspect of objective entities, which the soul under the control of moral forces seems to be reaching out to touch and to bring back into its possession. It is, we are told, precisely the error of "metaphysics" that it denies this office of the imagination.

I can only state here in the barest fashion some of the reasons which compel me to reject the violent separation just indicated between "ethical Ideas" and "intellectual Ideas" as essentially un-Platonic, and to insist that what I should call Plato's meta-physical theory cannot thus be divorced from his ethics. In the first place, Plato is, so far as I can discover, undeviating in his contention that the "Ideas" are apprehensible by reason only (*νοούμενα μόνον*) and not by any other faculty of mind. Take, for instance, the familiar summary of his view which is contained in the *Timaeus* (51 D & E). The question whether Ideas or intelligible essences (*νοητά*) exist is there made to turn upon the answer to the question whether reason (*νοῦς*) and true belief (*δόξα ἀληθής*) are distinct from one another (*δύο γένη*). These must, it is contended, be affirmed to be distinct, because they come into being separately and they are unlike one another in nature. The one is engendered in us by means of instruction, the other comes about through persuasion; the one is always accompanied by a true ground or reason (*μετ' ἀληθοῦς λόγου*), while the other is *ἄλογον*. Consequently, it is concluded (52 A) we are entitled to assert that there is *one kind of being* which is always the same, uncreated and indestructible, invisible and imperceptible by any sense, and that it is this which intellect (*νόησις*) contemplates. Now, Mr. More would have to say that "ethical Ideas" do not belong to this "one kind of being"; if they are "the creation of the image-making faculty" they obviously cannot belong to it. Mr. More notes that the name "imagination" does not itself occur in Plato's writings, and this, no doubt, is true, for the term *φαντασία* is generally employed by Plato to denote the presentative faculty, by which an object appears to the mind on the occasion of perception. But, although the name may be absent from the Platonic writings, what the name denotes is not absent. In the *Philebus*, for example, Plato speaks of "the other artist" (*ἕτερος δημιουργός*) who, along with "the

secretary of records," is busy in the chambers of the soul, and paints pictures (*εἰκόνες*) that may refer either to the past or the future (39 B). And this process of imagination is expressly assigned to the region of belief or opinion (*δόξα*). Indeed, Mr. More himself describes the operation of imagination as based upon the data of perception. Is it, however, conceivable that, while ascribing the apprehension of the other Ideas to *νοῦς*, Plato should have ascribed the apprehension of the highest of all of them to *δόξα*? Apparently Mr. More would reply that we have here a superior form of imagination which deals with the "material given to it by the immutable law of morality" as the inferior form deals with data of perception. In that case, one can only ask, what then, according to Plato, could this "immutable law of morality" be, if it be not an "Idea," and how would he have accounted for its apprehension? In the second place, if Plato had intended to make the fundamental distinction which Mr. More maintains he did between two classes of Ideas, I cannot conceive that he would so continually have enumerated alongside of one another Ideas belonging to these two classes without so much as a hint of the radical difference subsisting between them. Should we not have expected him at least to have touched upon it, for example, in the *Phaedo* (65 D), where, after referring to absolute justice and beauty and good, he goes on to say that it is not of these alone, but of absolute greatness and health and strength and of the essence of everything he is speaking when he is denying that reality is ever perceived through the bodily organs; or in the *Republic* (V. 479 A *sqq.*), where after having mentioned the beautiful, the just, the holy, he proceeds to mention, in precisely the same way, the great and the small, the heavy and the light, etc., as instances of ultimate essences? I doubt myself whether Plato would have allowed even the difference which Prof. Ross specifies between universals which qualify individuals and ideals towards which individuals

approximate, for I imagine that for him the Ideas, as transcendent, would all have been ideals. Be that, however, as it may, certain it is that, as Prof. Ross points out, "ideals" are not confined to the sphere of moral conduct. Plato himself reminds us that the knowledge at which the mathematician aims is knowledge of that which is ideal (*Rep.* vii, 527 A *sqq.*). The visible dot is only representative of the point, the visible chalk stroke of the line, and so on. The real objects of mathematical science are pure rational entities to which we in perceptual experience can only approximate. And the intimate way in which illustrations drawn from the spheres of mathematics and ethics are brought into connexion is itself sufficient to show that in this respect no vital severance was constituted between them. In the third place, unless Mr. More means -- what, indeed, he cannot mean -- that Plato took "the immutable law of morality" to be one of the "intellectual *generalia*," it would follow, according to his view, that Plato did not assign to "ethical Ideas" a transcendent mode of being, but conceived of them as immanent in the modes of conduct characteristic of individual moral agents. For clearly as "products of the imagination," however much they may be "projected outside the soul," the Ideas cannot exist "separately and independently" of the mental activity that gives rise to them -- the only mode of being they could have would be that of qualities of acts in which they are manifested. And thus the very ground on which it is claimed that Plato's "philosophy" is so immeasurably preferable to Aristotle's "metaphysics" would turn out to be illusory.

It is worth while, perhaps, pressing another consideration. Without disputing the traditional view that Plato's philosophy is prevailingly ethical, it may, I think, be legitimately questioned whether too much stress, in this reference, has not been laid upon the "Idea of Good." After all, the phrase itself occurs only in the *Republic*, although equivalent expressions are, no doubt,



frequent enough elsewhere. But it has to be remembered that the term τὸ ἀγαθόν had not for the Greeks an exclusively moral significance. The sense in which it was used comes out most simply, as Nettleship was wont to put it, in our familiar questions, "What is the good of so-and-so?" and "What is such-and-such a thing good for?" In answering either of those questions, we should indicate the use or purpose or end which the thing in question served; to say that it is good for something—or is, in this sense, good—would amount, in short, to saying that it has a meaning, that it is intelligible, that it has a reason for existing, that it is that which it was intended to be. And in the famous passage at the end of the sixth Book of the *Republic*, it is clear, I think, that the term "good" was intended to be taken in this comprehensive sense. It has, undoubtedly, an ethical significance; it is "that which every soul pursues, and for the sake of which it does all that it does" (505 E), that without which there is no unity or consistency or pervading purpose in human life and conduct. It is, however, not only the unconditioned first principle of practical conduct; it is likewise the unconditioned first principle of knowledge. Its relation to intellect (νοῦς) and the objects of the intellect (τὰ νοούμενα) is analogous to the relation of the sun to sight and to the objects of sight (508 C). As light, coming from the sun, enables colours to be seen and the faculty of sight to see, so trueness, coming from the Good, enables the Ideas to be known and imparts to the knower the power of knowing them. If, by means of dialectic, the soul could penetrate through the appearances of sense and traverse the entire realm of absolute being, it would arrive at length at the τέλος, the end or meaning, of the intelligible world, and it is that which is signified by the "Good" (532 A). And finally, the "Good" is the unconditioned ground of the existence and essence of all that is other than itself, because it is only in virtue of being good for something, of serving some end or purpose in the cosmic scheme, that either an Idea

or a phenomenon can be said to possess reality (509 A & B). Ultimately, that is to say, the structure of the world of real existence is determined by its relation to a final end or purpose, and in describing such final end or purpose as "the Good" Plato was employing the term in a sense which extended far beyond that which it bears for us. In brief, this passage shows, in the most conclusive way, how widely removed from Plato's thought must have been any radical distinction either between "intellectual" and "ethical" Ideas or between our means of becoming aware of them. He was working, in fact, with the conception of *τέλος*—with the conception that the nature of a thing is equivalent to its end or function in the whole to which it belongs—in other words, with the very conception that was the basal principle of Aristotle's "metaphysics."

I can discover, then, no justification for discerning in Plato's philosophy the "irrationalism" which Mr. More tell us he finds there and which he would fix upon as the outstanding merit of Plato's mode of philosophizing. Plato could never, it seems to me, have spoken of "the independent and irrational reality of the Ideal world," because to have done so would have been, from his point of view, to have given utterance to a palpable contradiction. On the contrary, the Ideal world in and for itself, he would have said, must be through and through rational or intelligible; just on account of its being "independent" of the contingency and caprice of the realm of phenomena, it is fully comprehensible and knowable. For him, in other words, knowledge (*ἐπιστήμη*) and real being (*τὸ ὄντως ὄν*) exactly correspond to one another; wherever there is real being, it may be exhaustively known; and conversely that which cannot be known, that which is irrational, can lay no claim to real being. The Ideas, the universals, the objective correlates of general notions, do not vary, do not change with our changing points of view, are not relative as being dependent on this belief or on that.

By their very nature they are removed from all the contingency of ordinary empirical fact, and from all the variability that attaches to the objects of belief or opinion. Over against them stands in a dubious, hardly definable, position the world which is perceptible by the senses, every item of it transient, dependent as regards both its nature and existence on its relation to the perceiving mind, never completely presented, and knowledge of which can, therefore, never be final. Here, no doubt, there is irrationality, waywardness, caprice in abundance, and consequently when in the *Timæus* Plato comes to speculate upon its mode of generation he is constrained to have recourse to the aid of myth and pictorial imagery, and to confess that his account is exposed to all the errors to which belief, as contrasted with knowledge, is liable. So long as he was concerned with the unchanging archetype—with the permanent and intelligible reality—he could use the language of certainty; but now, when he has to deal with the imperfect copies or likenesses of the eternal essences, scientific exactitude, even rigid consistency, is precluded, and the most he can do is to weave a more or less probable story (29 B). Plato, then, in so far as he keeps these two realms apart, is enabled to claim for the Ideal world absolute rationality and intelligibility. Aristotle, on the other hand, in the attempt to bring them together, in the effort to incorporate the Ideal world in the world that we, in the order of time, first become aware of through sense-perception, was forced to admit the presence of an irrational factor in the very structure of what he took to be real existence. Matter (*ύλη*) was, in his view, no less eternal and indestructible than the form (the Platonic *είδος*) with which it was invariably conjoined. It was, however, frequently stubborn, unyielding, and it resisted the imposition of form; hence it gave rise to deviations from natural law and was the cause of monstrosities (*τέρατα*). That is to say, real existence as Aristotle conceived it, was to this extent "irrational" and "uncognizable." And since these are

characteristics which in Mr. More's judgment a sound "philosophy" must ascribe to reality, Aristotle would appear to satisfy his requirements in a way that Plato does not.

Prof. Ross has said something about the bearing of the thought of Plato and Aristotle on the problems of theology, in which obviously Mr. More is chiefly interested. The controversy as to how far the theological language, with which Plato undoubtedly clothes many of his speculative arguments, is to be interpreted literally is an old and interminable one; but the mere fact that certain of the Greek Fathers of the fourth century found in that language a support for the orthodox faith does not help us in coming to a decision.

With respect to the existence of God, much at least of the theistic language of the Dialogues must be regarded as figurative and metaphorical. When, for instance, the World-maker, the *δημιουργός* of the *Timæus*, is represented as fashioning the phenomenal world on the model of the unchanging world of Ideas, it is clear that this cannot be taken literally as an act of creation occurring in time, because we are expressly told (38 B) that time came into being with the regularly moving heavenly bodies. The creation could not, therefore, have been thought to be a temporal act, but could only be a pictorial way of expressing the fact that the phenomenal world is only explicable by reference to that which lies beyond itself. And, indeed, one can scarcely doubt that the existence of the phenomenal world, so far from being the result of an arbitrary act, was for Plato a metaphysical necessity, that followed inevitably from the nature of the Ideal reality. But if the story of creation be admitted to be mythical, it becomes excessively difficult to resist the contention that the whole conception of the *δημιουργός* was likewise intended to be regarded as mythical, as a pictorial way of representing what could only be represented pictorially. Moreover, it is not belief in one God but belief in a plurality of gods, with one doubtless

as supreme amongst them, that we should have to attribute to Plato, if we are to interpret his theistic utterances strictly. In the *Laws*, it is mainly the gods, rather than God, who are declared to exercise providential care over their human subjects, and to reward the good and punish the evil. On the other hand, I am not by any means sure that Aristotle's scanty observations on the nature of the divine consciousness have not often been misconstrued. Is it so certain that "a thinking on thinking" must necessarily have implied that God is absolutely shut out from the awareness of all else in the universe—save himself? At any rate, unless one is content to credit Aristotle with writing pure nonsense, to describe God's activity as "the activity of contemplation that contemplates nothing," must be a travesty of his meaning. Is the contemplative life of the σοφός (*Eth.* X 7) also to be interpreted in like terms? At any rate, when God is compared to a general of an army, to whom the order among the troops is due, or to the ruler of a people, it does not look as though Aristotle really intended to consign Him to a condition of Nirvana.

With respect to immortality, it has at least been questioned by competent scholars whether Plato's doctrine either extends to or is compatible with *individual* immortality. I doubt whether there is anything specific enough in the Dialogues to afford a means of settling the question, probably for the reason that the interests which in our thinking connect themselves with individual immortality would have had no significance for Plato. Certainly there are many of the myths in which individual souls are pictured as passing through probation or enjoying reward; but with reference to them the problem again arises as to how far they represent any portion of the philosophic system. No doubt, if by the term soul (ψυχή) be understood what in speaking of ἀνάμνησις Plato does understand by it—the consciousness of the intelligible world, or the way in which the intelligible world is conscious of itself—the soul is necessarily immortal, and that is the fundamental

ground on which Plato himself rests immortality. But this would not appear to justify belief in individual survival. Obviously, it is, in any case, only the rational part of the soul (*νοῦς*) that can survive the death of the body, for the "spirited" and "appetitive" parts are dependent upon bodily conditions and are expressly described in the *Timaeus* (69 C *sqq*) as mortal. It is difficult to conceive how, separated from the latter, the individuality of the rational part could be preserved, and in Aristotle's view it clearly was not. Probably Plato's own attitude towards the matter was that which he depicted as the attitude of Socrates (*Apology*, 40 C); and that to the end the prospect of a future life remained for him "a great hope" (*Phaedo*, 114 C) rather than an assured conviction.

In conclusion, let me guard myself, as Prof. Ross guards himself, from being supposed to be a champion of Aristotle against Plato. While I certainly hold the Aristotelian "metaphysics" to be a unique achievement of constructive genius, I think it an attempt to combine incongruous and incompatible features; and it seems to me that, despite strenuous efforts, Aristotle never really succeeded in surmounting the Platonic dualism. At every one of the crucial stages in his system—equally in his theory of knowledge, in his psychology, in his ethics, in his "first philosophy," there confronts us a hiatus creating difficulties precisely similar in character to those which he himself detected in Platonism. Indeed, I am afraid I am not so appreciative, as Prof. Ross suggests one ought to be, of Aristotle's doctrine of the immanence of the universal in individual things. It is perfectly true that of "that impatience with particular phenomena and of that desire at once to get away from them, which was," as Caird puts it, "the main weakness of Plato," there is in Aristotle's writings no trace. Unwearied of his polemic against the Platonic error of conferring substantive existence upon the generalities of thought, he insists, with ever renewed emphasis,

that only the concrete is the really existent. Excellent maxim ! *Video meliora proboque*, we can almost imagine him declaiming, *deteriora sequor*. For him, the Ideas must no longer be χωριστά. Nor, indeed, are they, if by that he meant existing in solitary state by themselves in a celestial realm. As the predicates of things, as the essences of the natural kinds into which the world of generation is divided, they have their abode here below. But transportation from heaven to earth works, in itself, no miracle ; mere proximity to, or remoteness from, a mundane environment is, after all, in respect to the vital issue, a circumstance of comparatively small moment ; the problem of the One and the Many is not solved by the simple device of stationing the One *in* the Many. For, although *in* the world, universals may still not be *of* the world, and conceived as Aristotle conceived them, they assuredly are not. A concrete fact is not, that is to say, a σύνθετον made up of a fixed, eternal type or form *plus* an indeterminate formless element, the two being somehow welded together. How exactly the universal is related to the particular Aristotle was no more able to inform us than Plato had been. Perhaps no term in the philosophical vocabulary more often proves an obstacle to scientific thinking than the term "immanent" ; and it is a delusion to imagine that in the notion of immanence is to be found a means of escaping the perplexities of Platonism.

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## VI.

SIXTH SESSION : *July 26th, at 8.30 p.m.*

*Chairman* : PROFESSOR S. ALEXANDER.

## SYMPOSIUM :

IS ART A FORM OF APPREHENSION OR A FORM  
OF EXPRESSION ?

*By* JOHN MACMURRAY, C. E. M. JOAD AND A. H. HANNAY.

I.—*By* JOHN MACMURRAY.

IN attempting to find a way through the maze of aesthetic theory, I have found that the simplest starting-point is usually the activity of the artist rather than the appreciation of his public. In particular, I seem to find that the question before us, whether art is a form of apprehension or of expression, admits of a clearer statement and a simpler treatment when we approach it from this angle. Even if it should appear eventually that the activity involved in appreciating beauty, whether natural or artistic, is identical, in its essential elements, with the activity of artistic production, a cursory glance at the subject suggests that this is hardly to be assumed *a priori*, and that the activity of the artist in production is likely to involve something additional to that of the critic in appreciating his work. For is not he himself necessarily his own first critic ? Therefore I propose to examine briefly and in outline the working activity of the artist in order to discover, if possible, what are the distinguishing characteristics of the functioning of the mind in the production of a work of art.



This method of procedure has its disadvantages. It proposes an empirical approach to a question which is not empirical, and so renders us liable to mistake the accidents of a particular manifestation of artistry for the essentials of art as such. Against this we must guard as best we may; and in particular we must bear in mind that our tendency to think either pictorially or in terms of language is likely to mislead us into a theory which will be derived from and merely applicable to painting and poetry. Such a theory, whatever it might be, would not be a theory of Art; for the very form of our question assumes the unity of artistic activity in all its manifestations. What we gather from the examination of the painter's or the poet's working must stand the test of application to any other form of artistry. But the method has many advantages to counterbalance this difficulty. It is much more concrete. We do not need to commence by subtleties of distinction and niceties of definition, which become so often the fetters of our freedom. We do not need to ask "What is imagination?" nor "What is beauty?" nor the more difficult question as to whether beauty is the only quality in a work of art which involves an aesthetic experience. We are at liberty to turn our attention to recognized forms of art, such as painting, music, dancing, poetry and drama. The subtler questions of judgment and valuation will fall for later treatment in the light of a simpler survey. For the analysis of our activity in appreciating a work of art almost defies our powers by its immediacy and directness; while the activity of the artist lies more open to dissection and is more obvious in its connexions. Nor do I think that this procedure burkes any vital issue; rather it enlarges the scope of our study. Apprehension and expression both enter into the production of a work of art. The question is about essentials. Is it in the artist's "apprehending" or in his "expressing" that we are to look for the key to the problems of aesthetics? We can then formulate the disjunction in our problem in terms

of the artist's activity. What is his essential power ? Is it that he is dowered with a more exquisite sensibility than ordinary mortals, through which he can perceive in the world around us wonders to which the mass of men are blind or deaf ? Is it that he can teach us to see and hear what he sees and hears, to appreciate what he appreciates, to apprehend what he apprehends ? Or is it rather that his apprehension is much the same as ours—a little keener perhaps by virtue of his training in observation, but essentially the same—yet that he is possessed of a magic gift whereby he transforms the common world which he shares with us into something finer and more satisfying ? Does he show us the world of reality as it is, or does he recreate it for us as we should like it to be ? Is it in this "expression" that the essence of his art lies ; in the change which he introduces into the world that he apprehends ? Is he effectively a man such that

"out of three sounds he can frame

Not a fourth sound, but a star."

It is this latter alternative which I believe to be the true one : and therefore I am aiming, in what follows, at showing that art is essentially "expression," resting upon and growing out of apprehension, and advancing in excellence in proportion as the apprehension on which it rests is profound and true : but that the apprehension is not its essence, but rather is its prior condition, and that true apprehension is the *conditio sine qua non* of all great art.

I propose to examine chiefly and to draw general conclusions from the work of the painter, and I choose the painter simply because it is in painting that artistic activity might seem most easily to be a matter of apprehension. There can be no doubt that in the simplest of all senses art must presuppose ordinary perceptual experience. There could not be a musician who was born deaf nor a painter who was born blind. Nor does art presuppose any particular state of sense-perception. It can

exist at a high or at a low level of empirical apprehension. Because of this we are able to disregard the complicated questions about the relations of "sensation" and abstract thought. The deepening of our empirical apprehension through understanding—the enlargement of the scope and penetration of our perceptual experience by means of the higher faculties of the mind—enriches the quality of the artist's work so far as it does not interfere with the sensuous appreciation and the sensuous presentation which he undertakes, but is strictly irrelevant to the nature of his artistry. What is presupposed is simply a world perceptually apprehended. We may therefore put aside all questions about truth in perception, and attend simply to the appreciation of the world which the artist perceives, whether he perceives it correctly and sufficiently or not.

The artist's appreciation of the world which he perceives is, however, important, because it is fundamental to artistic activity. But we need not raise any logical or psychological questions about its nature. We may state it and accept it as a fact. We will then mean that to the artist, as to all of us, there are certain elements of the world which are more satisfying to perceive than others, directly and immediately, whether rightly or wrongly. He prefers perceiving certain objects to perceiving others, without reference to anything but the perceiving. In apprehending the world perceptually certain things are discovered to be more satisfying to perceive than others, and this feature of our relation to the world persists throughout the range of perceptual experience, whether the objects perceived be relatively simple or relatively complex. If we may term this the fact of perceptual appreciation, we may say that the presupposition of artistic activity is a world perceptually apprehended and perceptually appreciated.

Now perceptual appreciation has the effect of introducing into the world a differentiation, an arrangement of objects in terms of their power of satisfying us in the act of perceiving them.

Certain objects are satisfying to perceive, others are the reverse of satisfying, and there are degrees in which various objects satisfy us in this way. The very existence of perceptual appreciation involves depreciation. If I am to apprehend objects in the world which thrill me with their surpassing loveliness, the mass of my experience must have a lower quality and must be less satisfying. And this contrast at least must be independent of the peculiarities of the observer's sensibility. It is incredible that the great artist should be less sensitive to differences in respect of beauty between the objects in the world he apprehends than his less gifted brother. He may see loveliness where I can see none ; he may find a perceptual satisfaction in what to me is dull and commonplace. But I cannot believe that this means that he finds everything beautiful ; that he is therefore less sensitive than others to what is ugly, or less apt to be depressed by normal dullness and lack of interest in the objects with which he is surrounded. He is not a man easily satisfied with the world as he finds it.

If now we turn to examine the activity of the painter in those cases in which he might seem to be simply registering what he finds in the world that is satisfying to perceive—the cases in which his art might seem most obviously to be an apprehension of beauty—this necessity of perceptual depreciation can be seen to have a definite bearing upon our problem. Even in painting it is rare to find an artist simply recording what he sees, or making for us a likeness of a natural object which he has found it satisfying to contemplate. But his activity often approximates to this extreme, and then his real talent seems to lie in a technical mastery of his medium and in his choice of a subject which is intrinsically satisfying to contemplate. The terms of our question rule out of consideration mere technical skill in transferring what he observes to canvas, so that our interest in such cases is concentrated upon his search for a satisfying object, and

we ask ourselves whether the essential element in his art lies in his power of apprehending beauty in the natural world.

The answer is that it does not. For in the first place his picture is not judged by himself or others by comparison with its subject. Its power of satisfying us is self-contained: it is cut loose from the model and left to make its own appeal. Its artistic merit cannot then lie in anything that requires comparison with the model. The artist is not seeking to convey information about his subject, not even about its beauty. But on the other hand this cannot mean that the picture has no reference to the world of natural perception. Otherwise why should observation of the world be so necessary to the artist, and why should his picture have a theme at all? We demand some sort of fidelity to nature from the artist, and the artist is second to none in insisting upon this. Even the painter who wishes to present mere light-effects or harmonies of colour, still insists on the necessity of studying these features of perceptual experience sincerely and intensely. Even the Cubist has a subject, however difficult it may be to recognize it from his productions.

What are we to gather from this? The picture, we are assuming, is in fact the reproduction on canvas of a landscape or of a person carefully and sincerely observed. We recognize that it does represent a landscape or a person. Yet we are indifferent, and the artist is indifferent, to the *particular* landscape or the *particular* person depicted. We are content to know that it represents, without being concerned to know whether it represents something actual. We treat the picture, and the artist means us to treat it, as a *hypothetical* object of perception.

And in the second place, what we are concerned with is the satisfactoriness of this hypothetical object for perceiving. The painter whose method consists of searching the natural world for a satisfying subject has to undertake the search because he cannot paint at all without asserting thereby that what he has represented

is satisfying to perceive. If, knowing that the picture was a transcript of an actual object, we turned from it to the model, it would not properly be to discover whether the picture was a good likeness, but to contemplate directly the beauty of the subject. The point of importance to note is the element of generic recognition which underlies such activity either in artistic production or in artistic appreciation. It has sometimes been concluded hastily from the fact that we are indifferent to the particular existence of the subject of a picture that the subject has therefore no intrinsic artistic value, and serves only as a peg on which the artistic effect is hung: that in fact the picture is simply a beautiful object, not representative, and with no reference beyond itself. But we are not indifferent to the subject. We are indifferent to the actual existence of what is depicted, but not to its potential or hypothetical existence. The picture must be recognizable, generically, not merely as a beautiful object, but as a "Portrait of a young man," or a "Stream in spate;" *what* young man, or *what* stream is a matter of indifference. But it is not a matter of indifference that it can be recognized as a member of a class of objects some of which have actual existence. Only so can it be appreciated as interesting or fascinating in its class, as a lovely landscape or a beautiful face. For its appreciation always involves a relativity to other scenes and other faces which are less satisfying to perceive. To express this shortly we might use an old term in a new meaning, and say that a work of art must be "perceivable" in the sense in which we insist that a hypothesis must be "conceivable," so emphasizing the fact that there is an implicit comparison in all appreciation.

If the examination of a case in which the artist is most literally re-presenting an existing object shows us that the actuality of the object is accidental to the artistic purpose, while its appreciation as a member of a class of hypothetical objects of perception is essential, we need not be surprised to find that there is not

normally in art, not even in painting, an actual object to which the work refers, and which it affirms to be satisfying, and that in some arts such a procedure would be impossible. We may return to an examination of the activity of the painter in cases where he departs from the model as he finds it. The painter continually takes advantage of the hypothetical nature of the artistic object to move farther and farther from the presentation of actuality. This constitutes his freedom. For his activity is "free activity" relative to that of the seeker after knowledge, just because what he produces for our apprehension is a hypothetical object, not an actual one. He is not dealing in reality. The fidelity demanded of him is a generic, not a particular fidelity. This enables him to select as a subject or model an actual object which is not itself satisfying to perceive, but which admits of a reconstruction which will produce a hypothetical object which is satisfying. The details of the method—selection, emphasis, substitution and so forth—do not interest us. The result does; for although the picture is derived from the model, it is no longer a presentation of what was apprehended in the model, but an evolution of that, a transfiguration of that. It resembles the model, but generically: making possible the perceiving of a hypothetical member of the class of objects to which the model belongs. If we then compare model and picture, we can see that the model is used generically, as it were, as an aid to the production of a member of the same class which shall be satisfying to perceive as the model was not. The judgment involved in the appreciation of the picture might then be stated thus: "Assuming the existence of the object presented, it is, in its class, peculiarly satisfying to contemplate."

I maintain therefore that in these cases at least the object perceived is assumed to exist for the purposes of its appreciation, and that this is essential to its recognition, and so to its apprehension: and that the necessity of its recognition implies the

actual existence of some members of the class to which it is recognized to belong.

Before passing on to apply these conclusions to other arts, there is another procedure of the pictorial artist which deserves examination.

The painter does not necessarily work from a model, not even from an imaginary model, a visual image. His work may start straight from a class-concept, of which he proposes to produce on canvas a hypothetical instance. This transformation of the apprehension of a universal or generic idea into a perceptual hypothesis may take place in the artist's mind before it is expressed on canvas, giving rise in the actual painting to the existence of an "imaginary model." But this is accidental, and, I believe, highly abnormal. Normally the perceptual expression of the generic idea takes place on the canvas, commencing with a *quasi*-geometrical schema which is gradually elaborated in detail. The first rough sketch, the "blocking-in," which is very often rectilinear, involves both abstractness and generalization, and might pretty accurately be described as a schematization of the concept. And if one follows the "working-up" of this schema, one can see the general idea gradually take form and body and become a recognizable individual. The elaboration of one part or one aspect of the whole seem constantly to suggest the elaboration and modification of other parts and of other aspects, and the process is governed by the artistic purpose of producing a recognizable and satisfying instances. In this way each stage in the production of the picture serves as a model for the succeeding stage, being recognized by the artist as satisfactory in certain respects and unsatisfactory in others, and therefore requiring further modification. These successive "models" take the place of an actual object of observation, and they can disappear successively because there is no reference in the finished work to any particular model, no representation of an actual object at all. This emphasizes a point which I take to be



important, that artistic activity works not towards a standard of perfection, but away from an apprehension of actual imperfection. The artist carries his work farther and farther from its starting-point in the imperfect actual, and ceases only when he can proceed no farther. The greater the artist, the less easily is he satisfied, even with his best efforts. This dissatisfaction does not mean that the artist has failed to "express his idea," at least if this is taken to imply that the artist has failed to put on the canvas something that he apprehends. If that were true, his failure would be simply a failure in technical skill. It consists rather in a direct apprehension that the picture before him is not completely satisfying to perceive, coupled with an inability to say why it is unsatisfactory, or to suggest any further modification. It is a confession of failure in the essential activity of art, the dynamic movement of constructing something for apprehension, not of apprehending something already real. This therefore is the heart of my conclusion about art. It is grounded in the apprehension of reality, not in a *merely* perceptual apprehension, but in an apprehension as complete and universal as all the faculties of the mind in harmonious co-operation can make it. But this apprehension is not art, but merely art's zero line, art's starting-point. From that starting-point art moves onward in an effort to create the representation of an individual which shall not merely be "perceivable" but also completely satisfying to perceive.

That this analysis of art can be applied to other forms of art than painting may be indicated briefly. Consider first the case of music, which has this in common with painting, that it appeals to our apprehension through the avenue of a single sense. Music is grounded upon the apprehension of the world as presented to the sense of hearing. The "objects" of auditory perception are not normally sounds, any more than the objects of visual perception are normally colours. We hear the wind and we hear the nightingale, or the nightingale's song. *What* we hear is an

event into which successive or simultaneous sounds enter as elements. These events are recognizable; they have their similarities and dissimilarities; they fall into classes and can be understood. Some of them are more interesting or more impressive or more beautiful than others. If this is borne in mind, the apparent difficulty of translating our conclusions into terms of music disappears. The musician's starting-point is the world of these "sound-objects." The gulf that seems to separate the sounds of the normal world from a Beethoven concerto does not arise from any peculiarity of the artistic activity in the musician, but simply from the empirical peculiarities of the sense of hearing. For hearing alone is a much less effective means of cognizing the world than sight alone; partly because its objects are normally intermittent and confused, partly because their recurrence in a form which is easy to recognize and interpret is relatively rare. Only in a few cases can sound be the medium of an apprehension of an object or event with characteristics other than sound. There is one important exception, for sound in speech and song does serve as a normal medium for the expression and apprehension of emotional states. This explains why we sometimes apprehend a piece of music as a representation of the wind or the sea, and very frequently as a representation of an emotion expressed in sound. Whether this is always so or not is not essential to my argument. There is another point which seems to be more important. What is the entity which we call a work of art in music? It is individual, but it admits of repetition. It is something other than this or that interpretation of it. To this question I am not prepared to give a positive answer, but I should like to suggest the parallel with the painter's art. When someone asks me as we listen together to a pianist, "What is he playing?" I answer, for example, "that is Beethoven's C minor Sonata." So when I am asked in the picture gallery, "What is that picture?" I may reply, "that

is the rich young man, by Watts." In both cases the assertion is to be taken, not literally, but hypothetically. I find it easy to explain what I mean by "the rich young man." I find it very difficult to say what I mean by "the C minor Sonata," but at least I mean a single individual thing which I apprehend by hearing the pianist's performance. And I come to apprehend it better after hearing it played again and again by different performers. And this object is most certainly only a possible or hypothetical individual, its apprehension and its repetition depending absolutely upon its artistic creation and recreation. Thus the case of music is essentially the same as that of painting. It rests on the musician's apprehension of things by auditory perception, and upon his power to create others of the same generic character, but more satisfying to hear and apprehend by hearing.

The artist who would deal in movement has a limitation of another kind to face. He cannot find an adequate means for the creation and presentation of a hypothetical individual. The introduction of the cinematograph has opened up a range of possibilities, and some crude attempts at the artistic production of a moving picture which has the requisite hypothetical form, such as the "Adventures of Felix the Cat," have been made. But so far nothing sufficiently satisfactory to be described as fine art has been the result. This potential form of an artistic presentation of a satisfying movement has only succeeded in the case of dancing, where the human body is the medium of expression. This in turn limits the natural class of the movements which can form the starting-point of the artist's creative activity to those which the human body is capable of representing in terms of its movements. Again, as in the case of music, bodily movements are mainly correlated for apprehension with states of mind. It is perhaps because of the close connexion between bodily movements and the modulations of the voice in speech that dancing is so

rarely artistically successful except to the accompaniment of music. However that may be, what has been said of the application of the theory to music holds good, *mutatis mutandis*, to dancing. What is apprehended by the spectator, or by the performer himself, for that matter, is not a set of actual bodily movements, but the dance, a hypothetical individual which admits of repetition by the same or by different performers; and if we assume for the moment that what is apprehended is a state of mind expressed in bodily movement, then the state of mind so represented is not necessarily, and never essentially, the actual state of mind of the performer, but a hypothetical state of mind represented by the performer through the medium of his own bodily movements.

If lastly we turn to consider the arts which employ speech as their medium, whether poetry or prose, we find no difference in principle, but only a very great extension of the number and nature of the classes of objects of apprehension which can become the starting points of an artistic activity. The basis of speech is sound—articulated sound, and it is possible for the artist to take this aspect of speech as his main object and to produce a work the appreciation of which depends almost entirely upon the rhythm and cadence of its music. But such work is never, I think, felt to be artistically adequate, because of its elaboration and individualization of only one aspect of its medium; and for the same reason prose is never so adequate an artistry of speech as poetry can be. For the order and arrangement of speech can never be merely music; it must have a grammatical structure which is simply nugatory if it does not express a movement of thought and an articulation of thought. Speech always implies communication, and what is communicated in speech must itself be satisfying to apprehend if the speech itself is to be artistically satisfying. The expression of an unlovely thought in lovely music, even if possible, (and in some degree it is surely possible),

must always be permeated with artistic futility, and remain a failure.

It follows from this characteristic of speech that what is presented for our apprehension is always itself an apprehension of the world. A poem can never merely set the world, or any object in the world, before us for our consideration, but always an experience of the world, or an apprehension of some object or aspect of the world expressed and communicated through speech. But this experience is presented as an individual idea, not as truth. Artistically we must treat the poem as the expression of an idea, the thought and the expression being inextricably fused. The artistic question about it is not whether the idea is true, (we are in no sense invited to believe it,) but whether it is satisfying to apprehend, for we are invited to apprehend it as an individual idea, as a possible existence. But again it is, for artistic purposes, a hypothetical existence. It may in fact be an expression of the poet's actual idea, it may be that he has simply chosen from among his experiences one which as an individual experience is satisfying to apprehend; but as in the case of the imitative painter, this is entirely irrelevant to the artistic purpose. The actual poem makes possible, for the artist and for his public alike, the apprehension of an individual object. And in the artistic purpose that object is treated not as the artist's actual apprehension of an object, either actual or hypothetical, nor as a hypothetical apprehension of an actual object, but as hypothetical in both its aspects, as a hypothetical apprehension of a hypothetical object. Or to put it perhaps more clearly, the object which the poem enables us to apprehend is itself a hypothetical object as hypothetically apprehended. In appreciating poetry we are contemplating, as it were, a possible mind in its reactions to a possible world. The "truth" which is demanded of the poem is again simply a generic fidelity which enables the object to be apprehended or recognized as an indi-

vidual in terms of our experience of actual individuals, in order that its hypothetical individuality may be appreciated. Thus the nature of literary art is essentially the same as that of pictorial art, only its object is more complex. And this complexity is in certain respects dictated by the character of speech, the literary artist's medium. Such a complexity of the individual presented is seen at its highest in the representation of a drama on the stage, inasmuch as its appreciation involves an apprehension through various senses at once, and an appeal through music and colour as well as through speech and movement. And in the dramatic performance, where the apprehension of the audience approaches most nearly to the normal apprehension of ordinary life, the hypothetical character of the spectacle presented is most obvious. The life on the stage is not a piece of real life: there are real persons there, but they are not there as real persons. Their dress, their movements, their gestures do not express their characters or states of mind. Their speech is not a communication of their thoughts. Equally they do not express the dramatist's character or the dramatist's thoughts. In fact neither the actors nor the dramatist are there at all. We are looking at hypothetical beings living in a hypothetical world. But they are beings that we can apprehend and appreciate in a world that we recognize and find satisfaction in contemplating. The theory of art which I have tried to set before you can indeed be more simply deduced from an examination of the drama than from an examination of any other type of art; and the reason is not far to seek. In the presentation of a dramatic work the artistic object approximates most nearly in its concreteness to the ordinary objects of our everyday experience; while in the other arts we are compelled to adapt ourselves in a greater or less degree to less familiar ways of apprehending, much as we should be compelled to adapt ourselves to the actual world if we suddenly became blind or deaf.

Art then is not apprehension, although its works are apprehended. Apprehension is its condition, but not itself: and the apprehension which is its ground is not the apprehension of its product but simply the ordinary apprehension of the actual world. Art is the creation, for artist and for any public that may look with him upon his works, of a possibility of apprehending what is not actual but yet is satisfying. We must also remember that the apprehension demanded is perceptual, not imaginary. The mere creating of a mental image is not a work of art. At the most it could furnish the apprehension which is the starting-point of the artist's activity. A mental image can never in itself provide the possibility of a hypothetical individual. It would remain for the artist, who alone can entertain it, an actual existent, necessarily subjective. It could never represent more than its mere self as the work of art necessarily must. To effect its purpose it must be cut loose from its support in the individual mind and given a sufficient objectivity. Such independence, however interpreted, is essential to its function.

The object that the artist thus makes it possible to apprehend is asserted as satisfying him, and as capable of satisfying any mind that perceives it. That is the claim which is involved in any artistic production. The question of the standards of art is a question about this claim. But it is not a question into which we need to enter. The work may fail to substantiate its claim: then it is an artistic failure, but it is still a work of art. It may fail to present any recognizable individual of a hypothetical kind for apprehension: in that case it is not a work of art at all. Whether all artistic failure is a failure to present an individual for apprehension, and therefore a failure to be a work of art at all, is a possible question to which I do not propose any answer. We are concerned with the nature of artistic activity, not with the criterion of its success or failure.

In conclusion I should like to explain, in a very few words, what I mean by calling art an activity of expression. I do not mean the expression of an idea nor of an imagination nor of any apprehension of the artist's. The "expression" is the expression of an individual object for his own and other people's apprehension. He expresses in order to apprehend, not because he has apprehended. It would be misleading to say that he *creates* an individual, even a hypothetical individual. For the individual apprehended in the work of art does not exist, any more than it did before the artist got to work. He creates as a craftsman a natural object, a unity of colours, shapes, sounds or what not. But in and through what he creates he expresses another object, a hypothetical object, an object which can be perceived (not imagined) yet which does not exist. Thus not only is art itself not a form of apprehension, but the apprehension which it makes possible is itself an apprehension only of the possible and never of the Real.

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II.—*By* C. E. M. JOAD.

## I.

I HAD better begin by enumerating the points in which I am in agreement with Mr. Macmurray, confining myself for the present exclusively to the graphic arts.

I agree with Mr. Macmurray (1) That a work of art is not to be judged by the fidelity of its comparison with or resemblance to an actual object.

(2) That this is because a work of art does not refer primarily to an actual object, not at least in Mr. Macmurray's sense of the word "actual," as, for example, to this tree, this landscape, this face, and is not representative of an actual object.

(3) That, nevertheless, art is grounded in the apprehension of reality.

From (3) I conclude that the element of "expression" in art arises from the fact that when an artist paints a picture, he expresses or represents the reality he has apprehended; and I reconcile this statement with (1) and (2) by the assertion that the reality apprehended is not an actual, individual object. This view, to which I shall return in a moment, is one which Mr. Macmurray explicitly disavows. Art, he says, is not "the expression of an idea, nor of an imagination, nor of any apprehension of the artist's."

Art for him is the expression of an individual object for the artist's and for other people's apprehension. This individual object is not created by the artist, nor indeed is it apprehended, at least it is not apprehended until he expresses it. And it is not apprehended until he expresses it, because it does not exist. "The individual apprehended in a work of art does not exist, any more

than it did before the artist got to work." It is, in short, not actual but hypothetical ; yet, in saying that it is hypothetical, Mr. Macmurray does not mean that it is any chance object that the artist may choose to imagine, for it is bound by two conditions : it must be (1) recognizable as a hypothetical member of a class of objects, of which some members actually *do* exist and to which the actual object, which, as we say, the artist paints, belongs ; and (2) peculiarly satisfying to contemplate. Although, therefore, the hypothetical object does not actually exist, we may say that it "is assumed to exist for the purposes of its apprehension."

It is clear that this account of artistic production involves three distinct entities (there may be more, but for my present purpose it is sufficient to insist on the existence of three). There is the actual object, which is, as we say, painted, A, the potential or hypothetical existence of which is important, although we may be indifferent to its actual existence ; secondly, there is the picture P ; and thirdly, the hypothetical object, H. H is not A, since A is actual and H hypothetical ; nor is it P, since P certainly exists in actuality and H does not. What, then, is H ?

I comess to finding considerable difficulty in understanding Mr. Macmurray's language on the subject of the nature and being of H. H is not created by the artist, nor is it apprehended by him. It is rather expressed by him in the course of painting his picture, and, when so expressed, it can be perceived or is perceivable although it does not exist.

Now the notion that we can perceive that which does not exist is in itself not free from difficulty, nor do I think that on logical grounds it could be maintained. But does Mr. Macmurray in fact maintain it ? Is he not forced in describing H to use language which suggests very strongly that H does exist, that is only intelligible on the assumption that H exists, and that is, therefore, incompatible with his assertion that H does not exist ? The point is important, since, if the object of art actually

exists, and exists independently of the artist's apprehension of it, then the artist may be defined as the man gifted with the faculty of apprehending it, and the element of expression in art is limited to the reproduction of what has been apprehended.

Mr. Macmurray in his account of H tells us that there is demanded of the artist fidelity, not a particular fidelity but a generic one. This would seem to suggest that a work of art must be true to a class type, were it not for the fact that H is explicitly stated to be not a class but a hypothetical individual of a class. In any event, however, I do not see how it can be maintained that a picture should be faithful to something unless that something exists. If it does not exist, it would be impossible to tell whether the picture were faithful to it or not, and the element of satisfactoriness in a picture, which is derived by Mr. Macmurray from P's fidelity to H, would be inexplicable.

Again we are, according to Mr. Macmurray, content to know that P represents "without being concerned to know that it represents anything actual." Now in the first place it is clear that P does not and should not represent A. What, then, does P represent? One would expect the answer to be H. But since H does not exist, it is difficult to see how it can be represented. It seems, then, that Mr. MacMurray's language about P being representative and faithful is inadmissible, unless H is assumed to exist. And, if H is not merely created or brought into existence together with P,—and we are told that it is not— then H must exist independently of P.

In this connexion I should like to draw attention to Mr. Macmurray's language with regard to the failure of the artist. The artist, we are told, may fail, not in the sense of a failure of technical skill, nor in the sense in which he may fail to express on canvas something that he has apprehended, but rather because of an inability to construct something completely satisfying to perceive.

In other words since H does not exist independently of apprehension, and since, where the artist fails, H is not expressed in the picture, it would seem that in cases of this kind H does not exist even hypothetically. What, then, is it that the artist paints when he fails? Something or nothing? Certainly it is not A, nor can it be H, since it is H that is expressed when he succeeds. It would seem, then, that it must be nothing. Apart, however, from the difficulty of this supposition, what is meant by the use of the words "not completely satisfying to perceive"? Do they mean simply that the artist and the spectators of his art do not like the picture that has failed? Apparently they do. Mr. Macmurray explicitly rules out of the discussion questions of criteria; but I hope I shall not be thought to trespass too far outside the limits he has laid down if I point out that this is to make the criterion of art purely subjective, and to reduce its appeal to the level of the pleasures of the palate. Good art is that which we like; bad art that which we dislike.

If, however, we are to endow with any other meaning the words "not completely satisfying to perceive," we can only do so at the cost of introducing the idea of something which *is* satisfying, in comparison with which the picture, which is not satisfying, is judged a failure. But this is to endow H with a real existence and to say that the artist fails when he has not succeeded in expressing on canvas the vision of H which he has conceived.

The difficulty about the being of H comes to a head with Mr. Macmurray's language about "class." H, we are told, is a member of a class of objects *some* of which have actual existence. I confess that this conception baffles me.

From the statement that *some* of the objects of the class exist it is to be inferred that other members of the same class do not. Personally I think it a misuse of language to speak of that which does not exist as in any sense belonging to a class, but even if we admit that there may be some sense in which it is permissible

to speak of entities which do not exist as being members of a class, it seems to me to be quite inadmissible to conceive of them as belonging to the same class as entities which do exist. The expression "a class of real objects" has meaning, and I am ready to admit that in some highly Pickwickian sense the expression "a class of hypothetical objects" may have meaning, but what I fail to understand is how the notion of a class which comprises both real and hypothetical objects can have any meaning at all.

If my difficulty is a legitimate one it seems to follow, either that H is not and cannot be recognized as a hypothetical member of the same class as A, or that H must be real and must exist. Let us pause for a moment to consider this latter alternative.

If we assume for a moment that H is real and exists, what is its relationship to A? I have already agreed with Mr. Macmurray that H is not A, but in so doing I have not excluded the possibility of its being differently and perhaps more closely connected with A than Mr. Macmurray's general view suggests. There are indeed hints in Mr. Macmurray's paper that this may be the case. Certain A's, he tells us, are more satisfying than others, and the artist prefers, therefore, to perceive certain A's to perceiving others. Again, we are told that art advances in excellence, in proportion as the artist's apprehension of A is both profound and true.

Why this should be so it is difficult to see, if Mr. Macmurray is right in supposing that it is not in any sense A that the artist is seeking to express, but a more beautiful and satisfying hypothetical member of the class to which A belongs (we are explicitly told that it is not A that must be recognized as satisfying, but H), and it seems safer to suppose that his *real* view is (or ought to be, if it is not) more nearly represented by the contrary and inconsistent statement, that the artist, just because he does not represent or express A, is enabled "to select as a subject or model an actual object which is *not* itself satisfying to perceive."

This, as I say, I take to be Mr. Macmurray's real view. But

is it correct ? Is it in fact true either that A need not in itself be satisfying to perceive, or that H, which is satisfying to perceive, does not exist, or that the expression of an unreal H and not the apprehension of a real one is the object of art ?

In order to answer these questions it is necessary to restate the relationship between A and H, and since this restatement can only be undertaken in the light of a different conception of the object of art and the nature of the activity of the artist, it is necessary that I should endeavour to give in outline my own view.

## II.

THE following statement aims at being as brief as possible, and I must rest content with summarizing a position, without attempting to enter in detail into the considerations on which it is based.

The question to which it seems to me that any theory of æsthetics must seek to provide an answer is, "Why is it that certain forms, colours and sounds when arranged and combined in certain ways profoundly move us, and move us in a particular manner, while a different arrangement of the same forms, colours and sounds moves us not at all ?" "Why," to take a concrete example, "does the statement of the theme of a Bach fugue thrill us to ecstasy, while the notes which constitute the theme, when played in reverse order, succeed only in producing dissonance or dullness ?" It is with the answer to this question that I shall be chiefly concerned during the rest of this paper.

"The starting point for all systems of æsthetic experience," Mr. Clive Bell tells us, "must be the personal experience of a peculiar emotion. The objects that provoke this emotion we call works of art." The emotions produced by works of art may differ in quality and differ in intensity. But they are all of the same type, and to emotions of this type we give the name of "æsthetic." Unless we agree that works of art all possess this common quality of provoking æsthetic emotion, and unless we

also agree that works of art and only works of art do provoke it, it is clear that when we speak generically of works of art as if they were objects belonging to a certain class we are talking nonsense. However they may differ in form, subject, or manner of appeal, unless they have this common quality they are not works of art at all.

A work of art is enabled to produce æsthetic emotion in virtue of the fact that it possesses significant form. To the question of what I mean by significant form I shall return in a moment. For the present it is sufficient to say that a work of art possesses significant form in virtue of a certain emotion felt by its creator to which it gives expression. It is the fact that the artist has felt this emotion while the copyist has not, which explains the otherwise inexplicable circumstance that, while a picture may move us profoundly, a reasonably exact copy or a photograph of the same picture will move us not at all.

This emotion felt by the artist, which is the indispensable condition of the presence of significant form in the picture, is an emotion for something which the artist has seen. The something seen will be, in its first description, an ordinary physical object—a face, a landscape, or a building—that which I have called A in Mr. Macmurray's paper; but I use the words "in its first description" in order to indicate the fact that it is not as a face, a landscape, or a building that the artist sees it. The ordinary man sees an object in relation to its possible utility to himself, and in so doing sees only as much of it as it is necessary to see for the purpose. Emotion may be felt for the object when seen in this way, but it is not the object itself which causes the emotion. An object seen as the ordinary man sees it may be a medium for conveying emotion, but it is not for it that the emotion is felt. The face of a loved woman may provoke the emotion of jealousy, the sight of a pointed revolver the emotion of fear, but these emotions are felt not for the object considered as an object,

but for the train of ideas which the object arouses. We do not in fact in ordinary life see things in themselves ; we see them in relation to the purposes which we wish to fulfil in regard to them, and as means to the fulfilment of those purposes. The artist, and the artist alone, sees an object not as a means to something outside itself but as an end in itself ; and in saying that he sees it as an end in itself—I mean that he sees it as a combination of significant forms.

But, I shall be reminded, I have said that works of art—and only works of art—present combinations of significant forms, and in so doing provokes æsthetic emotion. That is true, but may it not also be true that an artist sees in a material object what we see in a picture, and that the definition of an artist is, accordingly, a man who feels for material objects the æsthetic emotion which we feel for works of art ? May we not further say that it is because the artist has transferred to canvas the significant form which he has seen in the material object, that we obtain from his picture the same emotion as he obtained from reality ? In other words, just as we see works of art as ends in themselves, divorced from purpose, unrelated to utility, so does the artist see material objects. They are to him, as pictures are to us, not means for conveying an emotion but objects of emotion.

Now the power to see objects continuously in this way, not as related to the purposes of life but as combinations of significant forms, and hence as objects which arouse emotion, is a very rare one besides being an evolutionary mistake. “Biologically speaking,” as Roger Fry puts it, “art is a blasphemy. We were given our eyes to see things and not to look at them.”

The view that objects can be seen as ends in themselves—that is to say, as combinations of significant forms—is not one which it is easy to expound in a few sentences. It may be that no amount of exposition can render it intelligible to those who have not felt



an emotion for objects seen in this way. But most of us do, I am convinced, from time to time get a vision of objects as pure form. We have seen a landscape not as so many fields, cottage and trees, but as a combination of colours and forms, and have experienced the thrill that we normally obtain only from works of art. In such moments, I conceive, we see with the eyes of the artist, obtaining from material objects the peculiar emotion in virtue of which those gifted with the artist's power of expression are enabled to create significant form. I use the word "create" loosely, because it signifies what the artist is commonly supposed to do; but is creation the name properly to be ascribed to his activity?

This question can only be answered by examining a little more in detail what is meant by the words "significant form." The formal significance of a thing, I have said, is the significance of that thing considered as an end in itself. I might, but for the Kantian associations of the term, have described it rather as the significance of a thing seen as "a thing in itself," and I suggest that when we consider an object as "an end or thing in itself," we become aware of that in it which is of greater importance than any qualities which it may have derived from its human associations and relativity to human needs. We become aware, in short, of the reality which is behind it, and which is latent in it. It is this reality, and not the object in which it is manifested, that thrills the artist to ecstasy, and it is the emotion felt for reality which he conveys to us when he succeeds in transferring to canvas his vision of reality as a combination of pure forms.

If I am asked what I mean by reality my answer is—reality conceived more or less closely on the lines of Plato's Forms. Behind the world of sensible objects, imperfectly manifested in them and overlaid and distorted by the sensuous material in which it appears, lies the world of pure form. It is the world of reality in the sense that it is a world of perfect and immutable being, and

the world of which our senses make us aware belongs to a reality of a different order by reason of the fact that it is imperfect and continuously changing. I do not propose to assert that the Forms, in Plato's sense of the word, are necessarily the cause of the being of material objects, since this hypothesis seems to me to be open to serious logical difficulties. How, it may be asked, can that which is absolutely real and eternally the same be the cause and essence of the being of that which is imperfect, just because it is always changing? But although the Forms may not be the cause of the existence of sensuous objects, they stand, nevertheless, in a necessary relationship to them, the relationship being one which we most nearly express when we say that they lie behind the appearance of visible things, and give them their individual significance. When, therefore, I speak of the artist's vision of an object as a combination of pure forms, I mean that he possesses the capacity to disentangle the element of reality latent in the object from the sensuous material in which it is embodied, and, by expressing this vision in his picture, to enable us to glimpse the pure form which he has visualized.

It is for this reason that, though the form of artistic expression changes from age to age, the feelings that great art awakens have been the same in every age. The forms of art are inexhaustible, but they all lead along the same road of æsthetic emotion to the contemplation of the same ultimate reality. It is for this reason, too, that questions of æsthetic criteria of the sources of the work of particular artists and of their influence on their successors are irrelevant to æsthetic appreciation, and that it is not necessary to know how, when, or by whom a work of art was created in order that the vision of the reality which it imperfectly reveals may be attained. Art is a window through which we gaze upon reality; the panes vary from age to age and sometimes they are bright and sometimes dim, but the view which they offer is eternally the same.

And since art enables us to glimpse a reality which lies outside the realm of that of which we are normally aware, the emotions which it arouses are not of this world. *Æsthetic* emotion belongs to a world of its own, and is both unanalysable and unique. It is for this reason that we speak of the quality of remoteness in art. *Æsthetic* emotion is emotion felt not for this world but for reality, and, for so long as the vision which it vouchsafes endures, we are shut off from interests which this world begets. Our anticipations and regrets, our hopes and fears, are alike arrested. It is as if we were enabled for the moment to escape from the stream of life and, forgetful of the turmoil of want and desire, of striving and seeking which life involves, to be at peace upon the banks.

It may be fanciful, but I have always thought that the *æsthetic* emotion which we obtain from works of art is an emotion of the same kind as that felt by the mystic, and for the reason that it is felt for the same object. But while the mystic's vision of reality is direct, and is achieved by the contemplation of the mind without the aid of the senses, the artist's is indirect, since he uses, and uses of necessity, sensuous objects as a medium in which reality is seen and through which it is approached. The mystic's vision, moreover, is continuous and prolonged; the artist's is tantalisingly brief. Hardly are we aware that the veil has been lifted before it is redrawn; hardly is the vision glimpsed before it passes, and, in passing, leaves a feeling of indefinable longing and regret. Thus *æsthetic* emotion is at once the most satisfying and the most unsatisfying of all the emotions known to us; satisfying because of what it gives, unsatisfying because it gives so briefly, and, in the act of giving, hints at greater gifts withheld.

I do not propose to apply these conclusions to music further than to point out that in the emotion we obtain from music this element of remoteness is more marked than in the case of any other art. The musician is not hampered, as is the pictorial artist, by the necessity of starting with and from the objects of this world.

The representative element is, or should be, absent from his art. For him there is no A, and he is therefore enabled to proceed direct to the creation of significant forms. But the significance of the combinations which move us in music, like that of the forms which appear in a picture, is the significance of reality, and it is because the musician has imaginatively conceived reality that he is enabled to create those combinations of sounds which, as it were, let us through into the reality he has conceived. His so-called creation is, in other words, not creation at all ; it is an embodiment in the sensuous material of audible sound of those combinations which he has apprehended in his vision of the real.

For the apprehension of the world to which the combinations of music belong, and for the appreciation of those combinations when embodied in sound, there is required nothing of this life, neither experience of its emotions nor understanding of its interests. The musician deals with combinations which are intuitively perceived to be right in the light of his apprehension of the real, and although these combinations find expression in the audible sounds which strike our sense, the forming and hearing of these sounds is in no sense necessary to the apprehension of the combinations they embody. It is for this reason that music, like chess and mathematics, is the special province of the infant prodigy. It is the quality of remoteness from every-day experience which chiefly distinguishes music from literature and poetry which draw their inspiration from and make their appeal to the emotions of this world, and explains the element of impurity which attaches to operatic and to programme music. These fail to satisfy because, in attempting to make the best of both worlds, they succeed in neither.

I conclude by returning to the question with which I started, " What is the relationship of A to H ? " In the light of what has just been said, the answer is not far to seek.

The object of art is, I agree with Mr. Macmurray, to express not A but H. H, however, is not hypothetical, as Mr. Macmurray maintains, but real. It is, in fact, reality itself, and as such is but imperfectly represented in the material objects which we know by means of our senses. I shall, therefore, for the remainder of the paper call it not H, but R.

The fact that R exists and is real means that the activity of the artist is not so much one of expression as of apprehension. It is true that he expresses his vision of R on canvas, but, as I have already pointed out, Mr. Macmurray has explicitly said that this is not what he means by expression. Nor when we go to a picture gallery do we go in search of expression; we go in search of significant form. It is the form which the artist has apprehended, and it is his capacity to disengage it from the medium in which it appears and to represent it thus disengaged, that enables us to obtain from his picture the same emotion as he has already felt. It follows that just as the apprehension of significant form in the material world constitutes the essential function of the artist, so does the apprehension of the same significant form in the picture constitute the appreciation of his art.

But the fact that it is the business of the artist to present significant form does not mean that he can create it, as it were, in vacuo. He must first see it as embodied in a particular object. This object, A, constitutes at once a starting point and a focus for his activity. It enables him to canalize his æsthetic emotion and to concentrate his representation of reality. Thus in pictorial art A, the actual object, plays an essential part. It is essential not as an end but as a means. So long as the artist is enabled to see in A significant form, the precise nature of A is immaterial. Different artists will find different objects stimulating, and what appears as a combination of significant form to one will appear as a mere object to another. But this does not mean that all objects are equally suited to act as starting points for

artistic activity, or that all A's are in an equal degree manifestations of R. Some objects are definitely more lovely than others, and when we say that the poise of a head or the line of a down are beautiful, and say also that a manure heap is ugly, we mean that even for us the one contains more of significant form than the other. For the artist, therefore, it is a better subject, not in the sense that it is easier to represent, but in the sense that it is easier to work *from*. In other words, it is a better medium for the manifestation of significant form.

I conclude, therefore, first, that it is not an actual object that the artist apprehends, and that art is not, therefore, representative of actual objects.

Secondly, that art is nevertheless a process of apprehension.

Thirdly, that what is apprehended are certain combinations of forms and sound whose significance is derived from the fact that they are the combinations of reality.

Fourthly, that this reality is manifested as significant form in actual objects, and that, although it is but imperfectly seen in them, it is that which gives its significance to art and provokes æsthetic emotion in the artist and the spectator.

Fifthly, that both R and A are real, and that the relationship of R to A is that of a form to the medium in which it is manifested.

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## III.—By A. H. HANNAY.

MR. MACMURRAY adopts out of preference an empirical procedure, although he indicates that the concept of art is a genuine universal, and that it would be possible to pursue an *a priori* method of inquiry. I cordially share the preference for arguing from concrete instances, but, surely, if there is a universal concept of art of an *a priori* kind, its necessary characteristics will flash out from any particular instance and we shall recognize their universal applicability without having to examine, as Mr. Macmurray does, each separate art to see whether our conclusions apply to it, testing thereby their validity. I feel very doubtful whether there is a universal concept of art which will admit of deduction by an *a priori* procedure such as that followed by Croce. In that case the important question arises whether art can really be said to involve a universal concept and a special faculty or form of the mind. Both Mr. Macmurray (apart from the indication mentioned above) and Mr. Joad have left this question open; the definitions which they give, although firm enough in themselves, have vague edges, and it is not clear whether it is intended that they should be carved off from other concepts with sharp precision and set in logically watertight compartments, or whether they are what might be called general definitions which admit of a transition by subtle shades into other kinds of concepts such as those of history and philosophy. There would, in the latter case, be a number of border line varieties of art which it would be difficult to press into any hard and fast definition. The art of portraiture, which, whatever its æsthetic character, is a very noble art, might possibly be a case in point. In vain have æsthetic theorists endeavoured to make a portrait

a mere occasion for a purely imaginative or formal construction on the part of the artist. It is undoubtedly the fact that those portraits which are artistically the best are also historically the most intelligible and informative. Historical truth and beauty have here coincided.

Although Mr. Macmurray eschews Croce's rigorous, logical method there is a distinct resemblance between his definition of art as concerned with the possible in an individual form and Croce's famous theory of art as intuition or expression of the pure individual: but the resemblance does not go very deep. For Croce's art is the apprehension of the pure individual before it has reached the stage of truth or falsehood, and it is the first stage in knowing. Art is thus an inevitable and universal form of consciousness or apprehension and we can never dispense with it, however much we may endeavour to do so; but it is not apprehension in the ordinary sense of perception or judgment; it is peculiarly expression or image making. For Mr. Macmurray, while art is a kind of apprehension of the individual, it is not, I gather, *par excellence* the knowledge of the individual, and while its sphere is the possible, this is not because it is devoid of truth and awaits a process of conceptual reasoning to transform its pure possibilities into matter of historical perception; it is simply because the artist has turned away from his apprehension of reality to create a more satisfactory vision, and in that sense, I suppose, an ideal vision. Therein for Mr. Macmurray lies the expressive character of art.

That art is very essentially concerned with the individual is, it seems to me, incontestable. The aim of the artist is to produce something as self-contained and self-sufficient as possible, with the least possible reference to anything outside itself. Thus while the historian refers away all the while to an actual past event which he may or may not be recording accurately, the artist (supposing he be a novelist, dramatist or painter) just



describes an event without any suggestion that there may be a truth outside his description by reference to which the accuracy of his description can be checked. His description poses as being self-sufficient. But it does not follow that the artist is not in some more indirect way concerned with truth or falsehood, right or wrong, and that his aim is to be merely expressive in the Croceian sense. I agree thoroughly with Mr. Macmurray about the generic truth of art - which is not, as Mr. Joad hints, an abstract class truth, but appears in a concrete individual shape - but I do not see that this necessitates a retreat from reality, the search for the light that never was on land or sea. Here I follow rather Mr. Joad in his somewhat mystical view that the artist reaches out to a more real, Platonic truth lying behind the world of utilitarian observation. Mr. Joad, however, completely divorces this world of æsthetic forms from the ordinary world so that the work of art becomes entirely "non-representational," and is only expressive in the sense that it reproduces on a physical medium the vision conceived or perceived by the artist. On the one hand, I think that the artist's vision when articulated in a particular medium is a very different thing from the original inchoate vision, the initial apprehension of beauty, and that the physical medium plays an important role in determining the character of the statement; on the other hand, both the initial vision and the completed work of art seem to me to be expressive of experience generally: that is to say the forms and colours of a picture contain a significance which goes right beyond the bare physical concept of form and colour and embraces the whole world of human experience. The statement transcends the limits of the medium as a physical object. Thus a picture or a piece of music can be said to express a sentiment which is sensuous or dramatic, sublime or comic, and so on. The artist realizes his whole personality in the medium, and in order to guard against an abstract conception of art as concerned merely with the physical

medium—a conception which is all too frequent—it is well to retain the term expression as insisting on the unity of the mind in all its experiences. On this point I am uncertain whether Mr. Macmurray would agree with me. For instance, what exactly does he mean by the possibility of perception that the musical composer creates ? Is it simply a possibility of perception of a series of sounds or is it more complicated than that, a human experience somehow become articulate in the music ? Mr. Joad, following Mr. Clive Bell, attempts to exclude from “pure” art this human significance as being the result of association of ideas or arbitrary symbolism. It can be admitted readily that if this deep emotional significance of art were mere association of ideas or symbolism it would be an irrelevant overtone. But the concrete experience of art belies such a view, and it can scarcely be denied that even the most aloof of arts such as architecture, pure decoration and music can express the spirit of a period and of course in expressing it they do not simply reproduce it, but carry it to a higher degree of self-consciousness.

I notice that Mr. Macmurray avoids the term emotion while Mr. Joad revels in it. This is probably because it is needed as a justification for the use, in his definition of art, of the term “significant.” As Mr. Joad abolishes all representational significance it would seem at first sight that he ought to define art as “non-significant form”; for *ex hypothesi* the form being a unique entity, can only signify itself. Mr. Joad’s reply is that this form signifies an emotion. But lest it should be thought that he is surreptitiously reintroducing the world of experience which he has ostensibly renounced, he hastens to add that it is an “æsthetic” emotion; it cannot, that is to say, be brought even within the broad descriptions of dramatic, sublime, sensuous and so on; it cannot be classified or related to the rest of life.

The ultimate essence and criterion of art becomes, according to this view, emotion and not apprehension. The painter, it

is argued, does not reproduce either the landscape which he sees before him or imagines, he expresses the emotion which the landscape stirs in him, or rather he creates something which has the power of stirring a similar emotion in other people. Even here the resultant picture is neither itself purely an emotion nor a stimulus of the same kind as the original landscape (otherwise why not reproduce the landscape ?) ; it is an object of apprehension which has somehow got the emotion worked into it. And so you get the hen and the egg puzzle. Does the object of apprehension come first or the emotion, and which is the criterion of art ?

I suspect that the concept of emotion, although most useful in practical criticism, is a way of escape rather than a satisfactory definition. It is treated as something unique and unanalysable beyond which you cannot go. So of course are Croce's "intuition of the individual" or Mr. Macmurray's apprehension of the possible individual ; but they possess also the rational quality of being related to other elements of experience, of fitting into a coherent and organic system. Emotion, or rather the concept of emotion, stands apart in discrete unrelatedness, irrational in its uniqueness.

That the experience of art carries with it a state of feeling or emotion or a sense of value at a high tension is undeniable. But it seems to me that this emotion, in part, is just the sense of satisfaction of the perception or apprehension ; it is the desire to apprehend being satisfied and is parallel with the emotion which a scientist feels on making a discovery ; and in part it is due to the fact that the artist does not abstract from the unity of experience, and his expression therefore includes the state of feeling of the experiencing subject.

For the discovery which the artist makes is of a different kind to that of the scientist, and in comparison is largely devoid of the latter's dogmatic "objectivity." Both science and history,

particularly history, purport to ascertain and state facts. While it would be incorrect to say that the novelist does not assert the existence of his characters, for he definitely does write "as though" they existed, we know by an external comparison that these characters are not historical figures, and so we call them fictitious or imaginative. In themselves they purport to exist and to be real and true, but this we, the onlookers, say is pretence. Yet this may not always be the case. There is no reason why some of the characters should not be taken from life, and in the case of reflective poems such as Wordsworth's Tintern Abbey there is very little about the description that is fictitious or hypothetical. Mr. Macmurray's definition seems to apply to some art, but not to all. Negatively, however, it has a general application: the work of art is indifferent to historical accuracy. The question is whether this means also that it is indifferent to truth, and if it is not, what is the kind of truth which it reveals?

Briefly, in my opinion, art is fundamentally and always concerned with truth, with deepening and enlarging our knowledge and understanding of ourselves in contact with reality, and the difference between Mr. Macmurray's hypothetical individual and the actual object belonging to the same class is that the former is the more developed, the more clearly realized of the two. In this sense the creations of art resemble the Platonic ideas which Mr. Joad has in mind. It is not meant that art creates morally ideal types; art covers the whole ground of experience, throwing its light upon all kinds of horrible and curious things--the Quilps and the Falstaffs are as much ideal artistic creations as the more virtuous characters and they have enormously increased our understanding of human nature. This fact is not merely incidental to their artistic value: it flows directly from it. At the same time the artist is not indifferent to moral issues, indeed he is supremely conscious of them, and in searching for the truth about human beings he is simultaneously searching for

an ideal or ideals, and even when he concentrates on sordid and ugly aspects, the description is redeemed by the artist's passion for the truth or his overwhelming sense of pity, or, in the case of satire or humour, his hatred or dislike of the types with which he is dealing.

A comparison between the speech of persons in a drama or novel and in everyday life illustrates in a simple and direct way the kind of truth which art achieves. No one could pretend that the speech of Shakespeare's characters was "real" or an imitation of ordinary speech. It is only "possible" speech; but this surely is an inadequate and external description. When we are immersed in the drama and listening to the speeches we do not make any outside comparison, but consider the intrinsic truth and relevance of the statement, the extent to which it reveals the characters and the situation, thereby developing and sharpening our own insight and awareness. To put the matter in another way, we can only judge the "possibility" of the statement by the measure of its revelation of truth.

I do not mean to deny that art is compact of imagination; nor do I wish to exclude fancy and humour or in any way to confine art to certain fixed puritanical forms. And if it be really the case that the imagination is a unique form of mental activity and the first stage in thinking of any kind, and is itself indifferent to truth; then these are also the characteristics of art. But I suggest that the imagination is not altogether what it is usually supposed to be.

It is a common assumption that the first stage of any investigation or research is the employment of the imagination to put up suggestions. And it is assumed that some mysterious faculty of judgment then intervenes and claims or disowns the suppositions presented to it. Thus in science and history and philosophy imagination is transformed into knowledge of reality. In art, however, the imagination remains intact, and judgment

does not intervene to pronounce some suggestions to contain historical or scientific truth and others to be pure fiction. Croce's philosophy is in this respect just a systematization of the current view. It is none the worse for that ; but I propose, somewhat tentatively, to question the accuracy of this view. In doing so I am myself putting forward a suggestion. But I am not aware that I am only using my imagination. All along I am thinking or doing my best to think and the presentation of possible alternatives which is continually taking place in my mind is itself the movement of thought in search of definiteness and coherence. The value of the concept of imagination is that it implies mental activity, a process of construction or creation. But once it is realized that judgment is itself an activity of the mind, a complicated work of construction and not a mere looking on, the distinction between the imagination and the judgment loses a great deal of its force.

At the same time to imagine artistically is by no means the same thing as to imagine scientifically. For the scientist it is meaningless to state that "the floor of heaven is thick inlaid with patines of bright gold." Artistically it is a wonderful description. The scientist is not concerned with what I would call concrete psychological values, although he might be concerned with abstract generalities about psychology. He deals in dehumanized truths about quantities and movements. The artist is interested only in personal experience as a concrete totality. Hence to this extent the insistence on the emotional element in art is correct ; not because the artist "abstracts" emotions, but because concrete experience is shot through with emotion. The artist does not merely express concrete personal or psychological experience in the sense of copying or communicating it. His expression or articulation is itself an explication, a development, an enrichment of this experience. So we can turn from the work of a great landscape painter to nature

and our appreciation of nature is found to be fuller and keener ; it is of course not the abstract nature of science, but the personal experience of nature. Art does not copy or reproduce this personal experience ; it is this experience in its highest and most perfect form.

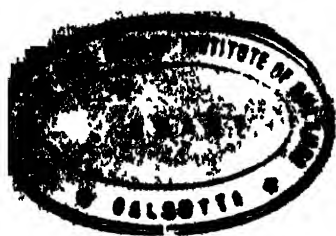
The manner in which this experience is expressed and comes into being depends upon the different historical circumstances including the physical medium, and there are sets of circumstances where art almost passes into history, producing, for instance, the modern biography or the portrait. In other cases the representative element is to all appearances non-existent, and the significance is of a vague and general kind. Architecture is a case in point. Yet one need only compare Greek and Gothic and Baroque architecture to realize how completely even this most "abstract" of the arts can express and enshrine an individual and personal outlook.

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